Southern California Association of Marine Invertebrate Taxonomists

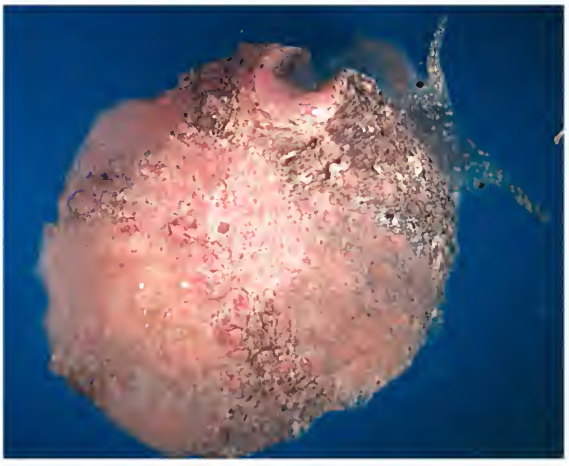
3720 Stephen White Drive
San Pedro, California 90731

May - August, 2000

SCAMIT Newsletter

Vol. 19, No. 1-4

SUBJECT:	The *Pholoe* and *Notomastus* of the Southern California Introduced Species Survey
GUEST SPEAKER:	Leslie Harris
DATE:	10 October 2000
TIME:	9:00 a.m. to 3:30 p.m.
LOCATION:	Los Angeles County Museum of Natural History Worm Lab 900 Exposition Blvd.



Lamellaria diegoensis Dall in Orcutt, 1885
SD-10, 7-21-00, 320 ft.
Photo by K. Barwick, 7/2000

8 MAY

The meeting was held at SCCWRP and the upcoming fourth edition of the SCAMIT species list was reviewed. There were no minutes from this meeting. The group would have divided into two sessions, one dealing with polychaetes, and one addressing all other taxa but too few polychaete folks were in attendance to proceed down that path. A list of proposed changes was considered based on the list of emendations planned or recommended for the third edition. In most cases attendees were able to reach a consensus, but some questions were take home - with examination of specimens required. Much progress was made, but it was apparent that a further meeting would be required to begin consideration of the polychaetes and finish the non-polychaetes. Some persons whose input was essential were not able to attend this meeting. In consequence some questions had to be deferred to a second meeting.

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SCAMIT Newsletter is not deemed to be valid publication for formal taxonomic purposes.

30 MAY

The second meeting for the month was at the LACMNH worm lab. President Ron Velarde started by announcing future meetings. The next meeting will be June 12 at SCCWRP. Participants will be continuing the work on editing Edition 4 of the SCAMIT Species List. On July 10 there will be an anemone workshop at the Dancing Coyote Ranch. Head wrangler John Ljubenkov will be examining and discussing Edwardsids and Cerianthids that were encountered in the Bight'98 project.

Several new job openings were mentioned. The University of Florida at Gainesville is looking for a wetlands biologist. This job is funded by a 5-year contract. The Los Angeles County Museum of Natural History has 2 curatorial positions open in the invertebrate department. The successful applicants will be sorting the large infaunal collection from Puget Sound that was obtained during the old Velero cruises.

Leslie Harris passed around two new polychaete publications. The first one was "Polychaetes and Allies: Fauna of Australia Volume 4A: Polychaeta, Myzostomida, Pogonophora, Echiura, and Sipuncula". It is a large volume (465 pages) and has many colorful plates. The second publication was "A Revision of the Australian Trichobranchidae (Polychaeta)" by Pat Hutchings and Rachael Peart. Leslie commented that it is a great review paper since it covers every family and genus of Trichobranchida of Australia.

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Dear SCAMIT members,

On behalf of the SCAMIT officers and the newsletter editor, I would like to apologize for our recent absence (for lack of a better term) of newsletters. Some of us involved with the writing and production of the newsletter became overwhelmed with work this summer and before we knew what was happening, we were behind on production. Once the journey down this slippery slope began, it was difficult to stop and change directions. So, in an effort to get back on track the following newsletter will be a brief compilation of the last four issues. It will contain minutes from the meetings and various pertinent announcements.

However unfortunate this slip has been it provides a good opportunity for us to request, again, that anyone interested in sending in material for the SCAMIT newsletter, please do so. Ideally, the newsletter should be a synthesis of different announcements, views, opinions, etc. The task of composing the newsletter has fallen almost completely on the trustworthy shoulders of Don Caiden (LACSD), who, as history shows, is a wonderful and prolific writer. However, he (I know personally) would greatly appreciate any help or input that anyone has to offer.

Thank you,

Megan Lilly
SCAMIT Secretary

Next, Don Cadien gave a brief report on the SCAS (Southern California Academy of Sciences) meetings he attended. One of the major areas researched was Santa Monica Bay, and topics included several talks pertaining to geological information as well as urban

influences. The effects of El Niño on local biota were also addressed, and range extensions of several species were documented.

Don told us about a donation of literature by Don Mauer. Four boxes of reprints were donated, consisting mainly of ecological literature. Don will bring these to the next SCAMIT meeting for everyone to peruse.

Larry Lovell then informed us about 2 more meetings. The International Crustacean Meeting will be held at Puerto Vallarta, June 26-30, 2000. Information concerning this meeting can be found at The Crustacean Society website,

http://www.lam.mus.ca.us/~tcs/

The Ichthyologist and Herpetologist Meeting will be held in La Paz in June.

Leslie passed around a jar containing several large specimens of *Chloeia viridis*. They were collected from Santa Catalina Island on May 13, 2000 at a depth of 40-60 feet. This is a northern range extension from Baja, California.

With the business portion of the meeting concluded, guest speaker Vasily Radashevsky took the floor. He was visiting from the Institute of Marine Biology in Vladivostok, Russia. The Institute is located on a peninsula between 2 small bays in the Sea of Japan. Vasily explained that the building itself was completed 10 years ago, and now supports approximately 400 researchers. The waters near the Institute support a rich and diverse polychaete community. Warm water currents flow northward from the Korean coast, creating habitats of various sediment types that support both boreal and tropical species. There are 5 joint biological stations along the coast of Far East Russia, with research being conducted along the coasts of the Sea of Japan, the Sea of Okhotsk, and the Bering Sea.

Vasily Radashevsky started his career in the area of polychaete embryology, studying larvae from the Sea of Japan. His research of polychaete larvae led him to examine all life history stages of polychaetes, so he now works on both embryonic development and larval and adult morphology. He has taken part in several large, international collecting expeditions, including trips to the south coast of Vietnam, Thailand Bay, North Korea, and the Commodore Islands.

He explained that in the early years of taxonomy, descriptions of new species were commonly short and only compared a minimal number of characters to distinguish them from closely-related species. With the discovery of cryptic and sibling species, it became even more difficult to separate these species, and researchers may need to employ molecular techniques to definitively separate them. As we discover more and more species, we are also finding that there are not as many cosmopolitan species as we once thought. Consequently, taxonomists need to use more characters to describe and define new species. Equally important is the work of going back to verify and supplement identifications of holotypes and previously collected specimens.

Vasily first became interested in cladistics and phylogenetic relationships in 1994 while talking with Frederick Pleijel. He said he likes cladistics because it is testable. Vasily has just spent 8 months at the Smithsonian Institute studying spioniform polychaetes. He is working on a manuscript with Kristian Fauchald in which they will describe morphological features, code characters, and then present a cladistic analysis based on 370 characters of these polychaetes. The Spionida were erected in 1962 and contained 10 families. The main character was the presence of anterior palps. In 1997 Fauchald and Rouse reduced the number of Spionida families to 7 in their analysis of Spionida clades. One family was later dropped (Chaetopteridae),

leaving the Apistobranchidae, Spionidae, Magelonidae, Trochochaetidae, Poecilochaetidae, and Longosomatidae as the current families in the order Spionida.

Vasily told us about some paleontological discoveries that may have been ancestors to the Spionida. Fossils were found in New York state that date back 300 million years. They were believed to be a boring species. Discoveries such as this give us an idea regarding how long ago spionid-like animals existed.

Next Vasily reviewed the families and their composition: 1) Apistobranchidae Mesnil and Caullery 1898, 3+ species, 2) Longosomatidae Hartman 1944, 5+ species, 3) Poecilochaetidae Hanerz 1956, 30+ species, 4) Spionidae Grube 1850, ca. 420 species (after Mackie 1996; Vasily believes there may be as many as 1000 species), 5) Trochochaetidae Pettibone 1963, ca. 10 species, 6) Uncispionidae Green 1982, 2 species.

In constructing a cladogram, Vasily and Kristian first looked for synapomorphies which are shared characters from common ancestors. They used the following external and internal systems to look for characters to code: trunk and segment structures, head and head structures, branchiae, pygidium, ciliated structures, chaetal (setal) arrangement and morphology, glands, central nervous system, sensory structures, musculature, digestive system, vascular system, excretory and reproductive systems, larval morphology, and ecology.

It is difficult to code the characters of metameric animals such as polychaetes. One must be careful in choosing appropriate characters and also must use a sufficient number of characters.

We discussed the importance of being consistent with polychaete terminology in order to make valid comparisons between specimens. Vasily has spent considerable time defining morphological terms thereby establishing a consistent, standardized approach. For example, he established a terminology for the pattern and position of spionid chaetae. By using this "scheme," he can score the chaetae (presence/absent scores) for the cladistic analysis.

Vasily commented that the specimens he examined at the Smithsonian Institute were in very good condition. He was able to view external structures as well as internal structures in cross-sections. An example of an internal structure that they coded and used in the analysis was found in *Trochochaeta multisetosa* (Orsted 1843). This species has unique ventral pads with fleshy extensions. In looking at the cross-sections, they could see that these pads were situated adjacent to a nerve cord, implying a sensory function. Characters such as these can be coded and used to determine synapomorphies. Vasily cautioned that one must be careful when coding characters since the process may reflect one's own pre-existing assumptions about homologies.

Vasily gave us his reasons for using species (as opposed to a higher classification level) for their cladistic analysis. He believed the generic breakdown in Spionida is fairly artificial and he cited an example. The setiger number on which branchiae begin is often used to separate genera; however, this character can change with developmental stages and therefore can be misleading in identifying small specimens.

If one is fortunate enough to have live material, differences in palp pigment may be used as a coded character. For example, *Pseudopolydora paucibranchiata* had bright yellow spots on the palps. This widely-distributed species was probably transported with oysters from Japan. Another species, *Polydora brevipalpa*, had paired spots on the branchiae. This species bored into scallop shells.

Vasily continued to give more specific examples of parapodial and branchial characters that were coded and used in the analysis. He discussed the difference between gills and branchiae. Specimens of *Dispio* have lateral gills in which each extension has its own blood loop. These are structurally different than regular branchiae. Some species of *Scolelepis* have lateral gills also. In *Poecilochaetus*, he defined two types of gills, notopodial lateral gills and neuropodial lateral gills.

There is much variation in the chaetae of Spionida. Many species have modified notochaetae, and their position can vary within an individual. In general, there is an increase in the number of modified setae from middle to posterior and a decrease in the number of regular setae. Two species that have modified notochaetae in the posterior are *Dipolydora bidentata* and *D. quadrilobata*. In *D. bidentata*, the tight bundles of spines do not protrude through the body wall whereas in *D. quadrilobata*, the spines do protrude. Vasily distinguished between these two character states.

Pygidial shape was another external character that was analyzed. This can be a tricky character and ideally, one should be familiar with ontogenetic changes in the morphology of the species under consideration. In the case of *Dipolydora cardalia*, for example, juveniles with approximately 40 segments had 4 lobes, and larger individuals with approximately 100 segments had 3 lobes (2 lobes had fused during development).

Neuropodial hooks were the next character addressed. One has to be specific when using the term hook because there are many different shapes and positions. When tridentate hooks were considered, they were coded differently depending on the position of the main fang in relationship to the upper teeth. Another codeable difference in hooks is whether the hoods are internal (as in *Paraprionospio pinnata*), partial, or external. In most polydorids, hooks in anterior segments first appear in post-metamorphic juveniles and then are lost in adults. This ontogenetic information is difficult to obtain, so unfortunately, we do not have it for most species.

Sensory structures such as lateral organs have also been examined although in a limited way. Poecilochaetidae have expanded lateral organs. They are relatively easy to see and compare in histological sections, and it would be informative to do more histological studies on different species.

Although many observations are lacking in the area of Spionida reproductive systems, there are some interesting modes which have been documented. Vasily had seen two types of asexual reproduction. In the first type, a couple of middle maternal segments from an individual form new anterior and posterior ends. In the second type, new segments are added in a linear fashion starting at the anterior end. Complete individuals then break away from the posterior end of the parent.

Species have different structures with reproductive functions that can be coded. The dorsal pouches in the middle portion of *Streblospio benedicti* function as brood pouches, holding the larvae through most of their development. When the larvae are released, they spend a minimum amount of time in the plankton before they settle. Females of *S. benedicti* can also store sperm in anterior segments until the female gametes are mature. Sperm morphology and egg mass shape are two more possibilities for differentiating between species.

Vasily went on to give several examples of character differences in Spionida larval morphology and development.

Ecological traits, such as habitat and vertical distribution, were also discussed.

Vasily stressed the importance of describing the morphological variability when describing a new species. The format he used is to first describe the holotype, then in another section of the paper, describe variability in several other specimens preferably with varying ages. Species descriptions of *Laonice* included the segment number where lateral pouches start and the number of lateral pouches. Vasily has noticed, however, that in some species of *Laonice*, this character varies with age of the animal.

I think I speak for all the meeting participants when I say that it was a pleasure to meet Vasily Radashevsky and listen to his very interesting and informative presentation.

12 JUNE

The second SCAMIT species list review was held at SCCWRP. Ron Velarde was the first to have the floor. He announced the July meeting which would take place on 10 July at Dancing Coyote Ranch. The topic would be Cerianthids and Edwardsiids, with a review by John Ljubenkov.

Larry Lovell (SIO) questioned Don Cadien (LACSD) as to the potential for future intercalibration trawls between agencies. Everybody present at the meeting felt that these trawls, in the past, had been helpful to the QA/QC process and kept us "all on the same page" in terms of invertebrate and fish ID's during trawls. Don stated that they have an interest in conducting intercalibration trawls on an annual basis but the lab is still waiting to get official approval for such an exercise.

A few new publications were announced, one being Polychaeta and Allies: the Southern Synthesis (Beesley, Ross & Glasby 2000) from Australia mentioned at the previous meeting by Leslie Harris. The City of San Diego had purchased copies of not only this polychaete volume, but the molluscs as well (which are a two volume set). This new volume continues a standing series, Fauna of Australia, and is Volume 4A in the series. These are not really identification manuals, but discussions of the subject group in many contexts, including behavioral and cladistic. They provide a synthesis of information available on the group, particularly as it relates to the Australian fauna. The utility of the volumes is broad, however, and they would be useful to any southern Californian worker in a covered group.

Don Cadien had the floor next. He announced an upcoming conference - Options for Dredged Material Disposal Management. It is a conference and workshop and will be held at the Massachusetts Institute of Technology (MIT) in Cambridge Mass, on 3 - 6 of December, 2000.

In regards to the SCAMIT species list, the same pattern as last month was repeated. We separated into two groups and discussed polychaetes and non-polychaetes separately. Ron Velarde, Tony Phillips and Dean Pasko were floaters, moving between the two groups. Nearly all of the problems remaining from the last meeting were resolved. Even so a few persisted. They are to be handled individually by consultation between the parties concerned in each individual case. The timing of the release of Edition 4 was pushed back to allow further time to answer the remaining questions and to finish preparation of voucher sheets for new or different forms encountered in B'98. Provisional forms for which voucher sheets have not been submitted for publication in the Newsletter will not be included in Edition 4, and will have to wait for Edition 5.

10 JULY

The meeting at Dancing Coyote Ranch went quite well and Dean Pasko (CSD) took notes for the Secretary who was away at the AMS/WSM conference. Following are Dean's minutes.

In attendance: Dean Pasko, Tony Philips, Don Cadien, Ananda Ranasinghe (SCCWRP), John Ljubenkov.

The business portion of the meeting was canceled because no officers were present. However, it was announced that Ann Dalkey will be retiring from the Treasurer position. Those of you who've always wanted to be treasurer of SCAMIT, next year will be your chance.

Don Cadien then distributed a draft of the SCAMIT sp. list Ed 4 for comments. Comments on the draft are due by first week of August, as he hopes to have a final draft done by end of that month.

It was announced that the Introduced species survey is to begin in August with Andy Cohen, John Ljubenkov, Don Cadien, Leslie Harris, and others (further information and a more complete listing of participants are covered in the upcoming September newsletter).

The taxonomic portion of the meeting had, as its focus, presentation of the materials prepared by John Ljubenkov as part of his specialist identification of edwardsiid and cerianthid anemonies during B'98. John was looking for feedback from users prior to submission of his final product. We began with the Edwardsiids. Some general characters of the family Edwardsiidae include:
- 8 way symmetry (as opposed to 6 in most other anemones, and 4 in Cerianthids)
- nemathybomes present or absent
- physa present, though in *Scolanthus* it is undifferentiated and is termed the "base". The physa acts as an anchor to allow rapid contraction of the column into the sediments.
- all have a terminal pore through which water is extruded when an individual must contract rapidly.

Metedwardsia sp. A is not included in the key because there were not enough large specimens from the Bight'98 project to yield sufficient data to provide a good description. *Metedwardsia* sp. A has 8-way symmetry, a true physa, and no nemathybomes.

Scolanthus sp. A differs from other Edwardsiids in the absence of a true "physa" and the continuation of the nemathybomes onto the "base". John noted that Manuel (1981) was wrong in his assertion that *Scolanthus* has a true physa. John agrees with Carlgren (1949) in this respect and refers to this portion of the animal as the "base".

Living specimens have red spots at the base of the tentacles. Similar structures have been shown to be light sensitive in other species of anemone. John has observed live *Scolanthus* sp. A and noted that the tentacles do retract when exposed to light.

Edwardsia californica, *Edwardsia* sp G, and *Scolanthus* sp. A overlap in occurrence from 5 - 10 m of water. *Edwardsia* sp. G —which may turn out to be *Edwardsia sipunculoides* — has the widest distribution of any species on the Pacific Coast. *Scolanthus* sp. A and *Edwardsia* sp. A have only been found in the Southern California Bight. *Edwardsia* sp. A is restricted to slope depths, having only been sampled in sediments over 200 m deep with higher abundance in 1000 m water.

Edwardsia californica has a retractile physa, which, when retracted, can create confusion with *Scolanthus* sp. A. The distinguishing character being in the distribution of the nemathybomes. In *E. californica* the nemathybomes stay in clean, straight rows whereas in *Scolanthus* sp. A they tend to scatter as you move closer to the base.

Dean noted difficulty in distinguishing *E. californica* from *Edwardsia* sp. G. He commented that he saw little difference in the nemathybome size and shape. John placed the two species side by side and there was a

distinct difference in size, with *Edwardsia* sp. G approximately one-third the size of *E. californica*. Additionally, when viewed side by side the difference in the distribution of the nemathybomes was quite evident. Difficulty will likely arise for those attempting to make these distinctions without the benefit of having made a side-by-side comparison and/or in dealing with small specimens of *E. californica*.

Page 1of John's handout included a table of nematocyst distribution in the various structures for the Edwardsiids in question. John used the nomenclature from Carlgren (1949), noting that recent studies have demonstrated that nematocyst size measurements represented a continuum and therefore are not useful in describing nematocyst types. Consequently, John was left with the general terminology to distinguish types. The dissections were difficult and consequently the table should be used with some caution. (NOTE: This statement is inferred from my query as to whether or not this table could be used to distinguish *E. californica* from *Edwardsia* sp. G based on the difference in nematocyst distribution. John could not provide a definitive yes/no, and commented that he was not 100% sure that when dissecting out tissue he was getting only the targeted organ, i.e., nemathybome.)

After John presented his key to the species we reviewed specimens and tissue sections of *Scolanthus* sp. A which John had made while working at the Alan Hancock Foundation, and entire specimens of each of the species included in John's key.

We then moved on to the *Ceriantharia*. John expressed some frustration in dealing with these poorly understood animals. The cerianthid literature suggests that the mesenteries occur in quartets, but even after reviewing many specimens, John has not been able to figure out this 4-part system. A certain degree of confusion results from the frequently twisted and contorted nature of preserved specimens which makes counting mesenteries extremely difficult. Further, John has encountered cerianthids with one specimen developing within the endocoel (body cavity) of another. In these cases the mesenteries of the "host" were often altered. In one or more cases John has seen a large cerianthid hosting an equally sized boarder where the host specimen has lost all its mesenteries. Such circumstances, combined with the frequently contorted bodies of preserved specimens, have served to thwart John's attempts at understanding the mesentery arrangement.

John's most important references include Carlgren (1949) the most complete treatment of the group; den Hartog (1977), the best modern reference; and Torrey and Kleeburger (1909), a reference for the Southern California species *Pachycerianthus aestuari*, *P. johnstoni*, and *Botruanthus benedeni*.

Tony raised the question of why *Ceriantharia* sp. C was not included in the key. John has not seen the species in quite some time and it was not encountered in the Bight'98 samples. Tony, however, does still see it in Santa Monica Bay. This species is distinguished by the abrupt end of the mesenteries mid-way down the column.

After this portion of the meeting was complete, Dean Pasko showed a sea pen (Pennatulacea: Virgularidae) with characters that did not match either *Virgularia californica* or *V. bromleyi*. This specimen was of decent size, with leaves bearing few polyps (approximately 3 - 6) (like *V. bromleyi*), pigmented at their base (like *V. agassizi*), but contained siphonozoids oriented longitudinally along the rachis. This combination of characters had not been seen by anyone in attendance at the meeting. Dean asked members operating in the SCB to be on the look-out for this odd species.

AUGUST MEETING

Unfortunately the August meeting was canceled and so with that we are now up to date. The minutes of the September meeting will be covered in the upcoming September Newsletter, along with many other interesting topics.

JOB OPPORTUNITY

Marine Sediment/Benthic Ecologist Sought! Specialist in Marine Sediment/Benthic Ecology wanted to fill permanent, full time position as a member of the Washington State Department of Ecology's Marine Sediment Monitoring Team, conducting studies to evaluate conditions and trends in the marine sediments of Puget Sound and Washington's coastal estuaries. For program description, visit:

http://www.ecy.wa.gov/programs/eap/mar_sed/msm_intr.html

Responsibilities: Development of study designs and preparation of project planning documents (Quality Assurance Project Plans, Project Implementation Plans); plan and participate in field sampling events to obtain marine sediment for toxicity, chemistry, and infaunal invertebrate analyses; analyze marine sediment data to determine ambient conditions, including spatial and temporal trends in sediment quality; prepare technical reports and scientific publications; present findings at meetings; and seek opportunities for collaboration and outside funding to benefit and augment efforts to assess marine sediment quality. Desirable Expertise: MS or PhD in marine sediment/benthic ecology, with experience in sediment toxicology, sediment chemistry, and/or infaunal invertebrate ecology; strong writing and analytical skills; and proven ability to work as a friendly, engaged, fully integrated and cooperative team member.

Salary Range: $3337-4270/month
Contact: Send CV and cover letter to,
Maggie Dutch
Washington State Dept. of Ecology
300 Desmond Drive, PO Box 47710
Olympia, WA 98504-7710.
Phone: 360-407-6021, FAX: 360-407-6884,
mdut461@ecy.wa.gov.

Must be an active candidate in the WA State Environmental Specialist 4 & 5 Eligibility Pool (1-9-087-OC GF). See the WA State Department of Personnel website for details on how to enter this eligibility pool:

http://www.wa.gov/dop/bulletins/19087oc.htm

The Department of Ecology actively supports diversity in the workplace. Women, racial and ethnic minorities, persons with disabilities, disabled veterans, and Vietnam-era veterans are all encouraged to apply. Disabled persons needing application/testing/interviewing assistance may call (360)407-6186 or (360)407-6206 (TDD).

UPCOMING NAMIT WORKSHOPS

October 28, 2000 - Cirratulidae polychaetes and problem species.
- Howard Jones and Eugene Ruff.
- Vancouver Aquarium

Feb-Mar., 2001 - Assortment of problem gastropoda and some Ophiuroid discussions.
- Speaker to be announced.
- Seattle area.

June 8 or 9, 2001 - Teeny Weeny Bivalves and how to tell them apart.
- Val Macdonald or other intrepid soul.
- Vancouver or Surrey, B.C.

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Please visit the SCAMIT Website at: http://www.scamit.org

SCAMIT OFFICERS:

If you need any other information concerning SCAMIT please feel free to contact any of the officers e-mail address

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Volumes 5 - 7 (compilation).....$ 15.00
Volumes 8 - 15 ..... $ 20.00/vol.

Single back issues are also available at cost.

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September, 2000

SCAMIT Newsletter

Vol. 19, No. 5

SUBJECT:	An Insider View of the SCX - *Pholoe* and *Notomastus*
GUEST SPEAKER:	Leslie Harris
DATE:	Tuesday, 10 October 2000
TIME:	9:30 - 3:30
LOCATION:	Los Angeles Museum of Natural History Worm Lab 900 Exposition Blvd.

Limacina helicina var *pacifica* (Phipps 1774)
I-21(2), 7-10-00, 132 ft.
Photo by K. Barwick (CSDMWWD) 10/2000

NEXT MEETNG

Leslie will present an overview, and a photo record, of activities during the recent Southern California Introduced Species Survey (SCX). She participated in the entire survey, hosted most of the participants at her home, and provided the lab in which each day's material was examined and identified. Problem specimens of *Pholoe* and *Notomastus* should be brought to the meeting for examination after they are discussed. The resources of the worm collection, including availability of types for examination, will be at hand.

EDITOR'S NOTE

Over the past few months I have had a number of inquiries following this general form, "When is the Newsletter coming out? I haven't gotten mine, did it get lost?" All have been very restrained and cordial (and most welcome,

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SCAMIT Newsletter is not deemed to be valid publication for formal taxonomic purposes.

since they indicate some readers miss the NL when it isn't there). My response has been invariably "as soon as possible". Little did I realize at the beginning that I was referring to a geologic timescale in making that statement. Smaller delays have led in the past to issuance of two Newsletter issues in relatively short succession in an attempt to catch up. Since no Newsletter had appeared since May of this year the Executive board, despite my protestations that I would catch up and produce a fast series of Newsletters, decided to provide one compendium issue containing the minutes of meetings between May and September. This June-July-August issue marks the first deviation from the one month-one issue pattern in force since the Newsletter's inception. This saddens me, particularly as I was the bottleneck preventing issues from appearing. I owe members and other readers an apology for this development. With better planning and some good fortune, it should not signal a pattern of future compendium issues. Thanks for bearing with these delays so gracefully, it was appreciated.

Don Cadien
Editor

MEETINGS

The November SCAMIT meeting will be held on 13 November at the Los Angeles County Museum of Natural History. Joining us will be Brian Edwards from the USGS. He will be showing ROV videos and/or still photos of various shelf fauna from the Southern California region. For those of us who rarely get to see these animals in situ this will be a welcome opportunity.

FIRST SCUM ANNOUNCEMENT

The first announcement of the Fifth Meeting of SCUM, the Southern California Unified Malacologists has come out ("SCUM one, SCUM all" - how true...how true). The meeting is scheduled for January 20, 2001 at the Times Mirror Room of the Natural History Museum of Los Angeles County where so many SCAMIT meetings have been held. Those who have never attended one of these meetings are encouraged to do so; those who have, need no inducement. They are wonderful, relatively unstructured, gatherings at which one can catch up on what others are doing, renew old acquaintances, and forge new contacts. (Please see the attached announcement at the end of the newsletter.)

EPA SYMPOSIUM 2001

A free four day symposium "Coastal Monitoring Through Partnerships" will be held April 24-27 2001 at the Beachside Resort and Conference Center, Pensacola Beach, Florida. The main topic of discussion will be the EPA National Coastal Assessment (Coastal 2000) in its various program manifestations, how they have fared, and how they have fostered cooperative action at different administrative levels. Information on these meetings is available from Virginia Engle (U.S. EPA) via phone (850-934-9354), fax (850-934-2403) or e-mail (engle.virginia@epa.gov).

NEW LITERATURE

Cnidarians can be rather difficult to separate based solely on external characteristics once preserved. It is often necessary to examine the nature of their cnidae to choose between closely related species. This cnidom has sometimes been treated as a unique fingerprint, which can be used to definitively identify a troublesome species. In previous parts of this multi-article series Williams (2000) has tested this concept, and sometimes found it wanting. He has investigated and documented the variability in cnidae complement and measurements found in a number of species, casting some doubt on the nature of their identificatory uses. The present article consolidates the information presented previously, and reaches conclusions regarding the taxonomic relevance and applicability of cnidae measurements.

The reproduction of clams which, by choice, pump sulfide rich water through their pallial cavity, is examined by Le Pennec & Beninger (2000). *Solemya reidi* is among them, as are some lucinids, calyptogenids, and species of *Bathymodiolus*. One of the investigated aspects was transmission of endosymbiont bacteria to the next generation. Results were ambiguous, as no route of transfer was conclusively demonstrated. A general trend of transgonadal transmission in obligate, and postspawning acquisition in facultative symbionts was noted however. The article is suggestive, but stresses the need for further data gathering before the questions addressed can be fully answered.

Bioinvasion continues to be a hot-button topic and to generate much attention in the literature. Most excitement is in the detection and initial response to an invasion, with long-term or historical treatments less common. Palacios et al (2000) provide an examination of the latter type, and cover the fate of a group of invading clams (*Mya arenaria*) in Grays Harbor, Washington. They are able to demonstrate that the original invasion [actually an introduction] in 1870 was but the beginning of a sequence of perturbations - all consequent of the original introduction. A very fascinating and thought provoking article. This particular history documents a sort of system homoeostatic mechanism which came into play once the original introduction was well intrenched. One would like to believe that the complexity of the marine environment provides for many and redundant homoeostatic mechanisms which collectively confer a good measure of resilience on the system as a whole.

A series of papers have recently appeared dealing with that interesting isopod group, the gnathiids (Grutter et al 2000; Tanaka & Aoki 1998, 1999, 2000). Isopod workers are tormented, in areas where there are a number of similar gnathiid species co-occurring [as is the case in our waters], by the difficulties of connecting adult males, adult females, and juveniles of one species together. Grutter et al (2000) do this for an Australian species via DNA analysis. Using the genetic data as a basis for establishing conspecificity, the authors are now establishing and describing morphological criteria which will allow separation of this species in the field. Tanaka & Aoki (1998), attempt to follow the life cycle of a species of *Gnathia* [later identified as *Elaphognathia cornigera*] on a sponge host. They hypothesize that the zuphea larvae are fish parasites, as is known for other gnathiids, but of bottom dwelling fishes which allow the larvae to remain on or near the host sponge. This proximity to the sponge allows them to directly note morphological connections between the juveniles and the sexually dimorphic adults. Having determined these connections they go on to examine spatial distribution (Tanaka & Aoki 1999) and reproduction (Tanaka & Aoki 2000) in the species.

Separation of cryptic species clusters using molecular methods is increasingly unraveling known or suspected cases where traditional taxonomy is inadequate or erroneous. One such is the freshwater amphipod *Hyalella*. Witt and Hebert (2000) analyzed specimens of *Hyalella azteca* s. l. from Ontario, Wisconsin, New Brunswick, and the Yukon to test for cryptic speciation in this glacial relict species. They found it. The examined material separated genetically into at least seven discrete species showing only minimal or no morphological divergence. Only one of these had previously been distinguished on morphological grounds, and that was synonymized with *H. azteca* by a later worker. Although the sequence data, also supported by allozyme data, delineates these taxa, there is still no morphological basis for their visual discrimination. In many cases two or more of these forms co-occur in a single collection indicating that they have either behavioral or ecological separation within the habitat. Were this a local marine form, our practice would be

to make it a CMPLX. As long as genetic and chemical analyses remain the exception rather than the rule, such stop-gap solutions must persist.

Williams (2000) applies the same combination of molecular (CO1 mitochondria DNA) and allozyme analyses to the problem of speciation in the starfish genus *Linckia*. Past proposals that the species of the genus were separated, among other characters, by color in life were evaluated in this paper. In one case where *L. laevigata* and *L. multiflora* were easily separable by color and relative arm length when live, the molecular data suggests there is no real difference between the species and that they are ecophenotypes of a single taxon. In *L. guildingi* the opposite was found, with two apparently cryptic taxa identified by deviations in genetic make-up. Our local Eastern Pacific representative, *Linckia columbiae*, seemed to be as genetically and enzymatically separate as its morphology had suggested. It was closest genetically to *L. bouvieri* from the Cape Verde Islands.

There is still plenty of room for traditional morphology based taxonomy, however. Although our strong El Niño has passed, we still need better information on the fauna just to our south and it is provided by Hendrickx (1999) for a number of brachyuran crabs. His focus, as in past volumes of this series, is on the Panamic fauna but some included species range into the southern California Bight. Among these are *Pyromaia tuberculata, Epialtoides hiltoni, Pugettia dalli, Pugettia producta, Pugettia richii, Pugettia venetiae, Taliepus nutallii, Herbstia parvifrons, Loxorhynchus crispatus, Loxorhynchus grandis, Pelia tumida, Scyra acutifrons*, and *Heterocrypta occidentalis*. As usual for Dr. Hendrickx his work is thorough, informative, and well documented. The volume is in spanish but that is not too big a hurdle for most southern California workers. Keys are provided for families and speciose genera and nearly all taxa are illustrated in full. Another fairly recent volume dealing with stomatopods (Hendrickx & Baragan 1996) applies the same standards to a different group. These volumes are available from Dr. Hendrickx. Contact him at **michel@mar.icmyl.unam.mx** for information or to place an order.

OLD LITERATURE

It was long my [editor's] dream to own a copy of that wonderful book, Sea of Cortez (Steinbeck, John & Ed Ricketts, 1941). John Ljubenkov and I used to pore over its pages in the library at California State University [then College], Long Beach. I had previously had the opportunity of examining S. S. Berry's copy - the only one known to have a dedication from each of the two authors. The same authors' later publication, Log from the Sea of Cortez, reissued the text of the original [largely Steinbeck's doing], but lacked the thing that made its predecessor most interesting - the "Annotated Phyletic Catalogue and Bibliography"of the animals of the Gulf of California.

This was long before Rick Brusca came forward with a handbook on the invertebrate fauna of the Gulf and was really the only book to treat the invertebrate fauna of the area. The mollusks, of course, were later treated by Myra Keen in her massive Seashells of Tropical West America, but other groups had no such champion. Well, the original was a collector's item and too expensive for a biologist's salary. It remains rare, but if you have the cash you can find numerous copies listed on the internet; or you can buy a reprint - as I just did. Yes, the book has been reprinted - actually several times. Even so the reprints themselves remain scarce and are not particularly cheap. But you can, if you persist, find a copy for yourself. The nomenclature is woefully out of date but this can be dealt with. The anecdotal information on the animals covered is worth the price of admission.

The Catalogue of the Chitons of the World by Kaas and Van Belle has been a convenient place to look for the current status of chiton nomenclature since it was first introduced in 1980. The second edition (Kaas & Van Belle 1998) consolidates changes made in the interim. It remains the compact and easy source for the information although no comments are provided beyond limited citations of name use. For commentary and explanation of the status of each animal one must consult the series of monographs on the world chiton fauna by the same authors (Kaas & Van Belle 1985a, b; 1987; 1990; 1994).

The gastropod genus *Diaphana* was reviewed by Schiotte (1998), who in the process created an additional species from California. Previously we had only *D. californica*, now Schiotte adds *D. pacifica* from a single shell in the collection of the Natural History Museum of Los Angeles County. It was taken in 83m off Cherry Cove, on the inner shelf of Catalina Island. The shell certainly appears different from that of *D. californica* but without the animal it is difficult to be positive it is *Diaphana*. Despite all the sampling done in the area, this remains the only reported specimen. There is some possibility that this may be *Parvaplustrum* sp B. The type is in the Natural History Museum and will be examined to confirm or refute this hypothesis.

NICE VACATION?

During July and the beginning days of August of this year a group of southern California taxonomists subjected themselves to a vacation in the British Virgin Islands. Mostly associated with the Natural History Museum of Los Angeles, these 8 people participated in a month long field season on Guana Island, BVI, working with NSF grant support to inventory the microfauna of coral reefs and associated benthic habitats. The program is under the joint direction of Dr. Todd Zimmerman and Dr. Joel W. Martin and included Todd Haney and Don Cadien (all four associated with the Crustacea Section), Dr. Gordon Hendler (Head of Research and Collections and Curator of Echinoderms), Leslie Harris (Worms Collections Manager), and Dr. Kirk Fitzhugh (Curator of Worms). The non-LACMNH participant was Rick Ware of Coastal Resources Management.

Leslie and Todd Zimmerman were on the island for the full month, while the remaining participants stayed for shorter periods. A team strength of six was maintained for all but the last few days, however. As in all biological vacations I am familiar with, the word vacation is hardly used in the normal context. Here it means an opportunity to work for 12-18 hours each day in the field and lab on tasks associated with the investigation. No laying on the beach, no cocktail parties under the stars, and no aquatic recreation. One of the goals of this project is to photographically record the live appearance of these small animals. Over 130 rolls of film were exposed of animals ranging in size from 1.5mm cumaceans to 25cm crabs, either directly through a dissecting microscope or through macrophotographic set-ups using trays or small aquaria.

Of course, our laboratory on Guana was far from primitive. We had six different dissecting scopes, several fiber-optic light sources, and plenty of equipment. Our physical facilities were also exemplary as we were staying in a large multi-room bungalow attached to the common area we modified as a laboratory. Like most islands in the area, Guana has little freshwater supply other than rain water. In consequence the plumbing in the bathroom uses saltwater for flushing, providing us a steady supply of fresh seawater which only required filtration to be ready for photography. Our hosts were the Falconwood Foundation who operate the Guana Island Resort. They provided our accommodations and fed us very well. Our three meals a day were, however, virtually the only time we were not “working” but since group planning meetings and discussion happened mostly over meals, we

often worked through them as well. Our one real vacation was a public outreach we did one Sunday with a Seventh Day Adventist Explorer club. Four of us met with them in an area adjacent to the airport on Tortola and spent several hours going over the local reef ecology and taxonomy with them. They were a very enthusiastic group, seemed to enjoy our efforts, and hopefully benefitted. So did I. This was the only time I was not either harvesting ARMs (Artificial Reef Modules) on the beach, or working in the lab during my 16 day stay.

Unlike the first year of the NSF grant in 1999, this year we did not perform any regular airlift sampling of infauna. Our time was devoted to the harvesting of the ARMs we had emplaced around the island in 1999. After a year of exposure these proved to harbor a large assortment of reef animals, many of whom we had not been able to locate by hand collecting in previous efforts. The materials used in the construction of the ARMs were designed to provide a simulated reef environment. Various nooks and crannies were designed and the surfaces of the materials were not smooth. This last feature proved to be valuable and a problem at the same time. The surface rugosity encouraged the settlement of larvae but made the surface very difficult to scrape. Many of the small tube dwelling organisms settled along grooves and other surface features that made them impossible to scrape off.

As in the natural reef, each of the ARM elements stacked together provided refuge for many large ophiuroids. As we disassembled each structure they deserted it with alacrity and moved down to either the next level or to the bottom of the tub in which the process took place. Care was taken to minimize such movements, as the performance of the various portions of the array were to be individually examined during data analysis. A photo record was made of the appearance of each level of the stack as it was exposed by removal of the layer above. The last portion of each harvest effort was the search through the rubble basket at the base of the array for photogenic items. This basket of natural coral rubble proved to be among the most productive of the divisions of the ARMs. A number of new species, new in the sense that they had not been encountered in two previous years of fieldwork in the area, were recovered from the rubble. One of the target groups sought in the rubble were small, agile crevice and hole dwelling decapods and stomatopods. They were well represented and the number of stomatopod taxa encountered rose considerably beyond what we had been able to catch in the open.

Processing of each array took several hours, with the fine fraction scraped and washed from each element separately, screened and preserved (after photo items were removed). Divers also brought up samples of promising substrate with each dive for live examination by the lab rats (consisting of Leslie Harris and myself during my 16 day stay). In some cases these were habitat samples from areas that had been productive in previous years, in others they were samples-of-opportunity from previously unexamined substrates. In previous years we had attempted to sample clumps of each of the various algal species observed, as well as samples of encrusting invertebrate substrates. These had yielded a broad cross-section of the area's microfaunal species diversity.

At the end of last field season, in an attempt to sample swimming peracarids, a brief test deployment of light traps was performed. It was moderately successful, enough for us to mount a more serious attempt this year. This effort was placed in Todd Haney's capable hands. Todd is working in the Crustacea section under a PEET grant studying leptostracans and hoped to find them in these near-bottom light traps. Last season we used small battery powered lights as the light source. This time a series of different colored cyalume sticks was used. Each was expected to last for only a short while and our deployments were much shorter than last year. We found

that with overnight deployments there was too much predation within the traps. Most of the cumaceans had, for instance, been decapitated - eaten like popsicles with the "stick" discarded. This was assumed to have been the work of the cirolanid isopods in the samples, but based on observations this year, ostracods may also have been involved. Traps were left out for less than two hours this year, with very gratifying results. Large numbers of peracarids, ostracods, and decapod larvae were collected by the traps. Comparisons of attractiveness of various wavelengths of light in simultaneous deployment proved interesting and will probably be published. Although it was not easy chasing these animals around a dish alive, eventually most species were subdued, separated, and given to Leslie to photograph. The pictures are back and I look forward to seeing them. In most cases these will be the first macrophotographs of these animals.

After the last of the ARMs was harvested and the last samples processed it was time to disassemble the lab for another year. We hope to be back on Guana again next year. Before then there remains much laboratory work to be completed and publications to be produced.

NEW RECORD OF THE PELAGIC CRAB *PLANES CYANEUS* IN CALIFORNIA (BRACHYURA: GRAPSIDAE)

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On 24 August 1999, a green sea turtle (*Chelonia mydas*) was found at the intake cove of the Diablo Canyon Generating Plant, San Luis Obispo County. Living on the turtle was a small male crab (carapace width 18.1 mm), which we identified as *Planes cyaneus* Dana, 1851. The specimen was deposited in the collections of the Natural History Museum of Los Angeles County (catalogue number 19990181). Williams et. al. (1989) gave this crab the common name of flotsam crab.

Planes cyaneus is widespread between 41° north and 35° S in the Pacific, Indian Ocean and southern Atlantic Ocean. It is rare in the northern Atlantic and Gulf of Mexico. In the eastern Pacific, it has been reported previously off British Columbia (Hart, 1963) south to Peru (Garth, 1946, as *P. minutus*). However, there are no previous documented records known to us of the species in California. Although older publications use the name *P. minutus* for this species, it is not the same species as *P. minutus* (Linnaeus, 1758), found in the northern Atlantic. See Manning and Holthuis, 1981, for a synonymy and discussion of the nomenclature.

The flotsam crab has been collected on driftwood and among stalked barnacles (*Lepas* spp.) It also associates with sea turtles. Steinbeck and Ricketts (1969, as *P. minutus*) found a male and a female at the base of the tail of a sea turtle taken off Magdalena Bay,

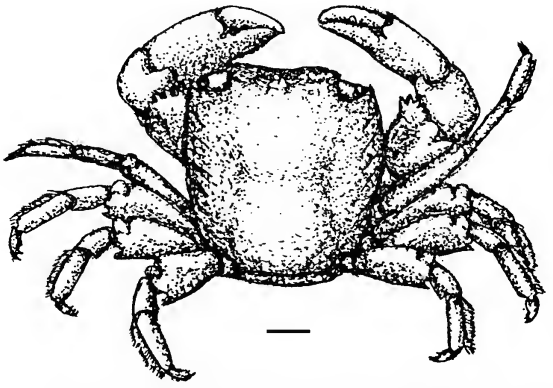

Figure 1. *Planes cyaneus*. Female from western Panama, Gyre station GO100/030, Texas A&M University teaching collection. Note characteristic fringe of setae along propodi of walking legs. Scale = 1 cm.

Baja California, Mexico. There are two color phases of the species: mottled with yellowish to dark brown blotches on a white background, or blue.

ED. 4

Edition 4 of the SCAMIT Taxonomic Listing approaches. Submissions are still welcome as are voucher sheets for provisional taxa to enable them to be included. It now appears that sheets which can be distributed with the October Newsletter should allow inclusion of those taxa in Ed. 4. Final corrections and additions are being made, but publication is not expected prior to the end of November. We will wait to include any changes introduced by the final volume of the Taxonomic Atlas series; Vol. 7 on Polychaetes. This has just been released and copies for us to review and compare with the taxonomy used in Ed. 3 will be available soon. We should also wait until the synoptic review of the B'98 sampling is concluded so taxa introduced during that effort can be fully evaluated and either accepted or rejected for inclusion. Comments on drafts distributed at recent SCAMIT meetings are also still welcome, as are new taxa encountered in routine monitoring. One such discovery is the flatworm *Hoploplana californica*, taken by OCSD in their most recent trawl effort. Contact Don Cadien at CSDLAC with any contributions to the list (**dcadien@lacsd.org** or 310-830-2400x403).

THE 1 SEPTEMBER MEETING

As seems to be the pattern this summer, the 1 September "August" meeting was canceled at the last minute due to scheduling problems. It had been planned that Dr. John Chapman would talk to us about introduced peracarids, with a summary of new records and occurrences from the just completed SCX. Flight schedules dictated that he leave early on the morning of the 1st, so we were denied the pleasure of his presentation. Similarly, our October speaker, Dr. Brian Edwards from USGS got tangled up in Jury Duty and his program will be rescheduled to November. Leslie Harris stepped into the breach and will lead a substitute program on the same October date.

SEPTEMBER 11 MEETING MINUTES

SCCWRP will be hosting a workshop titled, Collection, Analysis, and Interpretation of Sediment Quality Data. The venue is the Queen Mary Hotel, Long Beach on 24 and 25 October. The registration deadline was 1 October. For more information contact Debbie Elmore at **debbiee@sccwrp.org** or 714-372-9204. We will have several members in attendance and a report on the proceedings will be included in a future NL

Ron Velarde passed around new literature he'd recently purchased and/or discovered. The first two dealt with molluscs: Kaas & Van Belle (1998) Catalogue of Living Chitons; and Chitons of the World (Slijker 2000) [both courtesy of Tim Stebbins]. Michel Hendrickx has been busy again with two more crustacean books out. These are, the second volume of his treatment of the brachyurans of west Mexico (Hendrickx 1999), and a volume on stomatopods (Hendrickx & Baragan 1996) we had overlooked in the past. Don Cadien circulated several articles, and donated one and 1/2 boxes of reprint duplicates to SCAMIT.

SCAMIT is pondering the subject of the annual Christmas Party. Should it be held at the Cabrillo Marine Aquarium as it always has in the past? Or should it be moved to a different location? Should it be an annual event or perhaps every other year? Does Santa Claus still need to drop by since the attendance of children has dropped considerably over the years? We are calling for suggestions from those interested.

Don then updated us on the current status of the B'98 project. Data submissions are virtually complete and the first run through of the taxonomy has been completed. A large

number of species were added during the survey, some of which will disappear during the synoptic data review planned for the end of this month and early November.

Ricardo Martinez-Lara (CSDMWWD) then had the floor and told us about an interesting project he had participated in the previous weekend. An invasive species survey (the SCX) which involved sampling organisms that settle and/or colonize hard surfaces such as pilings or piers. The survey sites, ranging from Southern California down into Baja Mexico, were each sampled for exactly one hour. The collected animals were then taken to a lab [the San Diego Lab] and identified to the lowest possible taxon. The participants were Brian Bingham, Jim Carlton, John Chapman, Andy Cohen, Leslie Harris, Gretchen Lambert, Charlie Lambert, Ricardo Martinez, Steve Murray, Linda Rao, Veronica Rodriguez, and Rebeca Vasquez. Ricardo documented their activities on the Baja California locations with a digital camera. He is posting the resultant images, as well as some through-the-microscope digital photos of collected animals on the web for others to enjoy at:

http://www.dreamwater.net/biz/marteclab/SpeciesInvasion.htm.

The Cabrillo Monument is looking for volunteers to help in their annual intertidal survey. The intertidal sampling is from November 10 - 14 (mostly with the afternoon low tides). The work includes Owl limpet surveys and individual measurements, line transects, photo quadrats, bird counts, timed sampling, and more. For more information please contact Bonnie Becker, the Marine Biologist/ranger. Phone: 858-534-6740 or 619-557-7308 or via email at **bonnie_becker@nps.gov**. Volunteers are needed! Other projects where taxonomist volunteers would be welcomed include the development of an Invertebrate Species list for the monument and a settlement monitoring program.

SCAMIT is always looking for suggestions for meeting topics. If you have an idea or interest please contact either Ron Velarde or Leslie Harris with your input.

The first animal to be viewed was an ascidian brought by Don Cadien. The specimen, *Bathypera feminalba*, Young & Vasquez 1995 was discovered in a bottle from 137m off Palos Verdes. One of the distinctive features of this animal is the bilabiate apertures which are at a ninety degree angle to one another. When the animal is only half inflated it appears to have skirt and resembles a *Psolus* type holothuroid. The surface of the test consists of calcareous granules. In this species there is one major spine per granule, whereas in a similar species occurring in our area, *Bathypera ovoidea*, there are multiple spines per granule.

Kelvin Barwick (CSDMWWD) was next up with a strange looking Naticid that had been found at ITP Regional station, 2681 in 216 feet of water. Don Cadien and Kelvin took the snail through the key in Marincovich, 1977 and settled on *Euspira* sp. for an ID. The shell did not seem to match up with either *E. lewisii* or *E. draconis*, and no other described species seemed to fit it better than these two local choices. We then examined a small montacutid bivalve which Don thought might be a very small *Rhamphidonta retifera*. As this is not a species taken in the past by the San Diego lab, Don will bring some identified vouchers of the species to a future meeting. It is quite common on occasion off Palos Verdes.

Ron Velarde briefly demonstrated another specimen of *Philinoglossa* sp A, now retaken by the Pt. Loma lab at a different station, again in very coarse sediments. The finding of this additional animal from a different location suggests that specimens of this rarely encountered animal will accumulate as monitoring continues.

Ricardo Martinez had brought a *Dendraster* from a worker in Ensenada, Mexico and requested that it be identified to species if possible. There was some speculation that it was *D. vizcainoensis*, but upon further examination it proved to be *D. terminalis*. Although it was a juvenile, which caused some hesitation prior to ID, the absence of dorsal food groves confirmed it as *D. terminalis* since both *D. vizcainoensis* and *D. excentricus* have these structures. We also briefly examined a beautiful specimen of *Nacospatangus* that the San Diego lab provided as a voucher to CSDLAC, who so far has not encountered the species.

Time was then expended in considering local nemertean taxonomic practices. A recent communication with Ray Gibson by Dean Pasko had raised some concerns. Dean has discussed on the taxonomic list server the problems related to characters we use in separation of genera in the Lineidae. Gibson has offered to examine material from our sampling. Such an examination would be particularly useful for some of the species to which we apply the names of European described taxa. Tony Phillips has already commented on the list server regarding the problems with *Tubulanus nothus*; our form does not match what Gibson has from Europe. It is becoming increasingly clear that we need to once again meet to consider these problems and others related to nemertean identification.

HAVE WE BEEN INTRODUCED?

A local species introduction has recently attracted the attention of both the press and the authorities to one particularly notorious customer, the green alga *Caulerpa taxifolia*. This organism has been causing an uproar in the Mediterranean area for the last few years (see for instance Meinesz & Thibaut 1998, Thibaut & Meinesz 2000, Thibaut et al 1998), where its spread has created environmental problems. It has now been recorded from at least two sites in southern California and local agencies have responded in alarm, notifying the public of the potential threat and distributing leaflets that give a course of action if the species is sighted.

The debate over use of grazers on this alga, in an effort to control it in the Mediterranean, has raged and continues to be unresolved. At present no plans are in place for the rearing and distribution of either grazers from the algal home range, or native Mediterranean species which find it palatable. The question of use of grazers from the Panamic region in an attempt to control the present southern California outbreak is under consideration. So far however, the algal introductions are very limited in extent and probably can be handled without introducing another organism as a control. It appears likely that local occurrences of the alga are traceable to its use as an ornamental plant in the salt-water aquarium trade. This parallels the pattern seen in the Mediterranean where the source of the introduction was traced genetically to an escape of display algae from the Institute Oceanographique, Monaco.

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Please visit the SCAMIT Website at: http://www.scamit.org

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Back issues of the newsletter are available. Prices are as follows:

Volumes 1 - 4 (compilation).....$ 30.00
Volumes 5 - 7 (compilation).....$ 15.00
Volumes 8 - 15 ..... $ 20.00/vol.

Single back issues are also available at cost.

FIRST CALL!
SCUM ONE! SCUM ALL!
FIFTH ANNUAL GATHERING OF SCUM OF SOUTHERN CALIFORNIA
(SOUTHERN CALIFORNIA UNIFIED MALACOLOGISTS)

Saturday January 20
Times Mirror Room - 10 AM
Natural History Museum of Los Angeles County
900 Exposition Blvd., Los Angeles, CA 90007

Hosts: George Davis and Lindsey Groves

SCUM is an informal association of Southern California professional,amateur, and student malacologists & paleontologists, who are active or interested in research on mollusks. The purpose of the annual gathering is to facilitate contact and keep one another informed of research activities and opportunities. There are no dues, no officers, and no publications. SCUM is patterned after the Bay Area Malacologists (BAM), which is hosted by malacologists at different institutions each year.

This year's meeting will be hosted at the Natural History Museum of Los Angeles County. All persons interested in recent and/or fossil mollusks are invited to attend. Presentations and discussions are encouraged but should be informal and briefly cover current research interests. (Attendees will have a surprise presentation — to be further elaborated on in the next announcement.) A slide projector and/or overhead projector will be available for those wishing to present visual information. Coffee, tea, and breakfast somethings will be provided. We will break for lunch at noon. The Curator's Cafe (the museum cafeteria) will be open along with many other local food establishments within walking/short driving distance. Parking in the Museum's east Lot will be free, please mention at the staff entrance that you are with SCUM.

Please phone, FAX, or e-mail your RSVP so we can have enough 'breakfast somethings' on hand for everyone.

For further information, contact:
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FAX: 213 746-2999; e-mail: gdavis@nhm.org
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e-mail: lgroves@nhm.org

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Southern California Association of
Marine Invertebrate Taxonomists

3720 Stephen White Drive
San Pedro, California 90731

October, 2000

SCAMIT Newsletter

Vol. 19, No. 6

SUBJECT:	Animals In Situ - images from camera survey in Santa Monica Bay
GUEST SPEAKER:	Dr. Brian Edwards, USGS
DATE:	13 November 2000
TIME:	9:30 a.m. to 3:30 p. m.
LOCATION:	Times Mirror Room Natural History Museum of Los Angeles County 900 Exposition Blvd.

Cardiomya lanieri Strong & Hertlein 1937
LA City San. Dist., FB 12, Loc: SMB 68m 1/11/00
ID by T. Phillips & D. Cadien
Image by K. Barwick, 31 Oct 00

IN MEMORIAM

In recent Newsletters we have had a series of obituaries for noteworthy taxonomists and biologists. Austin Williams has now been eulogized in the Proceedings of the Biological Society of Washington (Lemaitre & Collette 2000). We must sadly add Dr. Ruth Turner to the list of those we have lost. The notice below was written by George Buckley and is reprinted from the bionet DeepSea newsgroup [thanks to member Larry Lovell for forwarding it].

"Ruth Dixon Turner died on Sunday, April 30. She held the Alexander Agassiz Professorship at Harvard University and was a Curator of Malacology in the University's Museum of Comparative Zoology where she also served as co-editor of the scientific journal "Johnsonia" . She graduated from Bridgewater State College, earned a Masters degree at Cornell University

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and a PhD at Harvard/Radcliffe under the direction of Dr. William J. Clench who brought her to Harvard from the Clapp Labs in Duxbury.

Turner who had begun her scientific and teaching career in a one room schoolhouse in Vermont went on to become the world's expert on Teredos, bivalved mollusks called shipworms. These marine borers cause widespread destruction by eating wood in the ocean environment, destroying piers, docks and wooden boats. She became known affectionately as "Lady Wormwood" for her work in this field. It was she that explained why there was little wood left on the sunken liner Titanic when it was discovered by fellow scientist Robert Ballard.

During her career which spanned some five decades Dr. Turner kept laboratories in La Parguera in cooperation with the University of Puerto Rico, Northeastern University's Marine Sciences Institute at Nahant, the Marine biological Laboratory at Woods Hole and at Harvard. Her work led to collaboration with the United Nations Food and Agriculture Organization, U.S. Navy Office of Oceanography which funded much of her research and the Woods Hole Oceanographic Institution where she became the first woman scientist to utilize the Deep Submergence Research Vehicle ALVIN to study the deep sea.

Over some two decades she participated in several dozen oceanographic expeditions. The Oceanographic Institution later named Turner a "Women Pioneer in Oceanography". She received many other honors including a number of honorary degrees. The venerable Boston Sea Rovers, an ocean education group of which she became an esteemed member named her " Diver of the Year" and in recognition of her accomplishments the U.S. Navy dedicated their book on "Biodegradation in the Sea" to Professor Turner. Other book dedications noted that she was a "Biologist par Excellence" and quoted her oft repeated motto "know your animals". Dr. Turner's last major project was as a member of the scientific team that investigated the wreck of the "Central America"- a sunken steamer that contained millions in lost gold. It has been called the most scientifically studied shipwreck ever by a Federal judge.

A past President and beloved member of the Boston Malacological Club and the American Malacological Union, Dr. Turner provided leadership to these organizations and guidance to their members who study seashells and other mollusks. She was a Director of the Marine Ecology Project and a consultant to many organizations including the National Geographic Society and its programs on deep sea vent systems. Lecturing widely, she shared her knowledge and love of the sea and its life. A dedicated teacher and skilled dissectionist and illustrator, Turner was a mentor to hundreds of students around the world. She trained people, opened doors for them and watched proudly as they started out on their own careers.

Dr. Turner leaves her sisters Winifred Garrity and Lina MacNeil. She is predeceased by her parents and her brothers Henry and Arthur and sisters Jessie, Mary and Frances. Contributions are being accepted to a Memorial Fund that has been established in her name at the Woods Hole Oceanographic Institution. A wake will be held on Thursday from 4-8 PM at Long Funeral Home in Porter Square, Cambridge with services on Friday at 11 AM.

[George adds the following personal comments]:
As a a teenager I began working for Ruth Turner and Bill Clench in the Mollusk Dept. at Harvard University's Museum of Comparative Zoology. Being the person with a car I became the "designated driver" so to say and ended up being in charge of field expeditions in the local area which led to many enjoyable afternoons and very early morning '"Minus tides" - the

better to collect marine specimens as well as leading to muddy feet and a very messy car as all sorts of marine fauna and flora were brought back to Harvard. Ruth provided sage council on my winning high school science fair projects on "Radula the teeth of snails" and was duly proud of my achievements. The job grew in importance as I had the prime responsibility on many occasions of getting Ruth " to the sub on time" at Woods Hole.

As I entered college the collecting went further afield with trips to the Everglades, the Altamaha River and Puerto Rico. Ruth was always there to provide guidance, support, training in dissections whatever was needed. I particularly enjoyed going to conferences and seminars with Ruth and observing the great good will shown towards her. She truly loved what she did and greatly enjoyed interacting with people and people loved her. I taught a course on Ocean Environments with her for many years at the Harvard University Extension School and even after she retired and I kept teaching the course she would accompany us on our field trips - "Cape Cod Expeditions" as they are known-well into her eighties much to the benefit and enjoyment of my students. Ruth will be missed by legions of students."

The above obituary was intended to be part of the May Newsletter. As this dragged out and was eventually replaced by the compendium issue, this text was unintentionally omitted. It is included here, belatedly, to inform our readers of Dr. Turner's death. We have suffered several more losses since then; both Willard Bascom, former director of SCCWRP, and Dr. Gil Jones, formerly of USC and the Allan Hancock Foundation have died from complications of broken bones. Information on Willard Bascom is available on the SCCWRP website (SCCWRP.org), but details of Dr. Jones death are still sketchy. He suffered a fall, was hospitalized then transferred to a convalescent facility, and there contracted infections in his setting bones that eventually took his life. He apparently died sometime in late August or early September, but the date remains uncertain. Any readers who have information on his passing, or any former students or associates who would like to share memories of Gil with others are encouraged to contact the editor.

NEW LITERATURE

In the last NL we discussed a recent paper in which the relationship between live coloration and speciation of starfish was considered. Deheyn et al (2000) consider similar evidence which suggests that the ophiuroid *Amphipholis squamata* is more than one genetic unit. This species, which is "cosmopolitan" and is reported locally in southern California, exhibits considerable variation in disk and arm coloration and pattern, and in the intensity of bioluminescence. The authors evaluated specimens from England, France, New Zealand, and Papua-New Guinea with regard to their coloring and bioluminescence, and found patterns that suggest direct genetic linkage of these parameters. They did not, in support, do any enzymatic analyses or DNA sequencing . This is one of a series of reports by the same authors on this organism, and perhaps they will in the future provide molecular evidence in support of their color and bioluminescence separation. Their current data does seem to suggest that the taxon *Amphipholis squamata* conceals a series of discrete taxa. [Dimitri Deheyn is now pursuing graduate studies with ophiuroids at Scripps. A nice write-up of some of his and co-workers current activities with bioluminescence is presented by Jennings (2000) in the magazine produced by SIO, Explorations. My thanks to member Larry Lovell for providing me a copy of the issue.]

Less problematic is a new species of the crab genus *Paralomis* found on a whale carcass off southern California (Williams et al 2000). As is usually the case with prolific and collaborative workers such as the late Austin B. Williams, his publications keep on coming for some time

after his demise. Two specimens of this new crab were found on an intentionally emplaced whale carcass at 1922m in the San Clemente Basin. This new species is not closely related to either of the known species in the genus from California, *Paralomis multispina* and *P. verrilli*. All three are found in depths greater than currently sampled in POTW monitoring. Unlike the two other species in our waters which have spined carapace and legs, the new species has a knobbed and granular carapace and legs.

Fiege et al (2000) tackle one of those messy problems having to do with missing types, unpublished illustrations, and a history of confusion of two separate forms as one. They reexamine the polychaete *Magelona mirabilis*, erect a new taxon closely related to it, and summarize the status and characters which differentiate the seven species known in the genus from European waters. Along the way they make observations useful to southern California workers and refer to the local species M. *sacculata* and *M. pitelkai*.

The myzostomids are an odd little group and despite their heavy modifications for symbiotic relationships with other taxa, they have usually been considered annelids. In the few instances when I have seen them as associates with echinoderms in local trawl catches they have looked, to me, like aberrant polychaetes. As part of the continuing cladistic reevaluation of animal classification, they have come under scrutiny (see also Boore & Brown 2000 for a consideration of the position of leeches, polychaetes, pogonophorans, and arthropods). A recent communique on the annelida web-site from Geoff Read dealt with this, characterizing the upshot of Eeckhaut et al 2000 as "Molecules move Myzostomida". DNA sequencing of two genes suggests that myzostomids are more closely related to flatworms than annelids. This result, if verified by others, would indicate that some of the characters previously viewed as uniting clades within the Animalia (such as possession of a trochophore larva) are instead homoplaseous.

One must remember that molecular data is not always paramount and may not agree with morphological data. Case in point is the aptly named article by Westheide et al 1999, "Systematization of the Annelida: different approaches". In what is basically a review article covering the most recent attempts to cladistically analyze annelids, three differing views are presented sequentially: those of Greg Rouse; those of Damhnait McHugh; and those of Wilfried Westheide and Günter Purschke. Each approach uses different methodology to approach the goal of annelid reassessment. Rouse' morphological analysis supports a monophyletic Polychaeta, while the other two suggest that Polychaeta is a paraphyletic concept. Comparison of the three proves interesting and each presents a plausible argument. No "winner" is declared, the nature of the existing controversy is merely laid out compactly for the reader. The placement of the annelids among other animal groups is considered by Jenner (2000).

Knowlton & Highsmith (2000) deal with less inclusive matters; the interactions of a predator population (the nudibranch *Archidoris montereyensis*) and its sponge prey (*Halichondia panicea*). The authors describe the relationship between this species pair as "a chase through space and time". The prey species is basically a fugitive, hiding from its pursuing predator in a matrix of uncertainty - patchily distributed in both space and time. When the predator comes across the prey it devastates it, but often the prey is missed by chance, in a system where chance is a design element.

Fractals give the same impression of chance and randomness hiding rigid design. Fractal geometry is applied to a consideration of habitat and patch structure in aquatic

environments by Schmid (2000). Mathematically this is tough sledding for some biologists (such as myself), but the author successfully attempts to distill the appropriate conceptual precis from the math. A series of concrete examples are also provided. This paper could be advantageously read by anyone concerned with interpreting the distribution of animals.

Although already assuming the dimensions of "a classic" the Bivalve Book [please take note of the capital B's] has only been available since June of this year. Like many other things its review was orphaned by the compendium issue of the Newsletter. The long anticipated and eagerly awaited debut of Coan, Valentich Scott and Bernard's Bivalve Seashells of Western North America has passed and it is now available. I expect most readers to already have one close at hand. Those of you who do not should waste no time in remedying that lack. You can do so at:

http://www.sbnature.org/atlas/bivbook.htm

The volume represents completion of work originally outlined by Dr. Frank R. Bernard prior to his death. His catalogue (Bernard 1983) gives some idea of the gestation period of this work. The degree of intensity applied by his coauthors to the project's completion can be seen in the short time between release of a species checklist (Coan and Scott 1997), and the arrival of the work itself. Although the concept was Frank's, and much of the background work was done prior to his death, final writing and preparation of the text and illustrations was done by Gene Coan and Paul Valentich Scott. The result is exactly what would make the long wait for completion worthwhile, a truly inclusive treatment of the bivalve mollusk fauna of the northeast Pacific.

The book, at 764 large format pages, **covers** the marine bivalves from Baja California to the arctic, and from the intertidal zone out to 4500+ meters of water. All marine forms, from the tiniest on up, within this geographic and bathymetric coverage area are treated. Each species is described, illustrated, and a synonymy provided. In nearly all cases an example of the species has been digitized, providing both internal and external views of the shell. Illustrations are in high contrast black and white and are uniformly presented. Supplemental illustrations of anatomy (typically whole body with one shell removed) are peppered throughout the book. These are drawings rather than photographs, which provide clarity instead of an uninformative sheen of moist tissue. Within each family the taxa are arranged into a comparative character table (or several in very large groups), which allows direct comparison of their salient characteristics. Subfamily and higher taxa are briefly keyed here and there throughout the book but the lower level separation is by character table.

One of the outstanding aspects of this effort is the degree to which it gathers references to a species taxonomy, nomenclature, morphology, physiology, life history, associations, etc. at the end of each species description. This provides access to a large amount of literature; over 4700 references are included in the 123 page literature cited section. Citations are presented COMPLETE, without abbreviations, and with full authorship. Our hats are off to the authors who fought to have such useful completeness included ["you can't do that, it'll make the book bigger and more expensive"] in the face of economic realities. The utility of the result more than justifies the additional cost entailed. Around the central core of systematically arranged species descriptions are a wealth of supporting information. Included are such uncommon items as a review of human-clam interactions (farming and fishery), a summary of the current understanding of the origin of the Bivalvia and it's relationship to other molluscan groups. More usual items are also presented, including a brief treatment of bivalve anatomy and shell structure, and a glossary.

So far I have only heard of two points of dissatisfaction among consumers - one related to a design decision, and the other an unavoidable consequence of the project itself. The first is that individual figures are not separately identified on compound plates. They are, of course, associated with the taxon name, but no figure numbers are provided to facilitate citation. This leads to references such as "*Panopea abrupta* on Plate 104" rather than "Plate 104, Figure 4". This has struck some users as an awkward and unnecessary complication. For most users of the book however, who are not including plate references in other publications, this is not an issue.

The second point is that this massive tome weighs a great deal. Being on coated paper, which allows the high quality printing of plates and text which characterize it, it can only be comfortably used on a table or lap. Hand holding is restricted to those with wrists the size of small trees. A very minor quibble, and an unavoidable consequence of completeness and high quality of the book itself.

Fortunately most of us have the requisite resting places for the book. Since the binding is very strong and well done, we can expect this volume to last physically despite its weight. The content should age gracefully as well, but like all major additions to knowledge it will promote its own obsolescence. This new tool should considerably stimulate research on bivalves in a good part of the world, an undoubted aim of the authors. It will be comprehensive for only a short time as it serves to smoke out new records of extralimital taxa and assist in the recognition of new forms within the coverage area.

First the Taxonomic Atlas series and now this book; the Santa Barbara Museum is emerging as a publishing powerhouse and major source of new taxonomic resources. This volume should be the constant companion of all west coast mollusk workers who do not restrict themselves to non-bivalves. Frank Bernard would have been proud of it.

OLD LITERATURE

Major areal monographs from other areas often wait years before being checked for applicability to our fauna. Such was the case with Bouchet & Warén (1980, 1985, 1986, 1993), whose multi-part revision of Atlantic gastropods was recently acquired by your editor. It is remarkable that all are still available in this age of rapid remaindering, but they are, as are the Kaas and Van Belle Chiton monographs discussed in the last Newsletter.

Much of the contents of these volumes does not directly relate to our local fauna but there is overlap in a few areas. Most useful is probably that dealing with the eulimids and epitoniids (Bouchet & Warén 1986), two families which are well represented in our fauna and in which generic level discrimination remains contentious. Anders Warén is pretty much the authority worldwide on the eulimids at present, and his observations and approach to their generic level taxonomy is useful reading for any mollusk worker worldwide. Although a number of individual papers have come from him in the last decade dealing with eulimid taxonomy, the revision in this series is by far the most comprehensive.

10 SEPTEMBER MEETING MINUTES

Upwelling and Oxygen Minimums
Dr. Lisa Levin of SIO recently gave a talk at SCCWRP which outlined her work on the communities of hypoxic and dysoxic environments associated with the Oxygen Minimum Layer in various parts of the world. She pointed out that the presence of these features is usually linked to upwelling systems. We always mention that upwelling is a prominent feature of the Southern California Bight but none of the programs currently monitoring POTW discharges measure

upwelling in their study areas. Upwelling can be inferred from water column profiles of temperature, salinity, and dissolved oxygen taken during quarterly regional water column data cruises, but between these quarterly points data are lacking.

Well they are available after all, just not in quite the fashion we might like. NOAA, through the Pacific Fisheries Environmental Laboratory, maintains a data record of upwelling intensity throughout the Pacific coast of the US. These data are gathered offshore and are derived from atmospheric data. Measurements are taken four times a day and have been taken since 1946 at some points, allowing a long-term view of upwelling in our area. These data provide upwelling evaluations for areas of the coast. Local bottom topography and current structure will modify this broad scale pattern in each area, yielding local patterns which vary from those provided by NOAA. The buoy derived data show, during the spring quarter at least, upwelling is virtually a daily phenomenon. There are considerable variations in intensity from day to day however, and these may be manifest locally by periods of intense upwelling followed by days in which upwelling is weak but still present. We should keep these patterns of fairly continual on-shore movement along the bottom and off-shore movement along the surface in mind when considering the movement of larvae of bottom invertebrates. Check out the data yourself at:

http://www.noaa.gov/products/PFEL

For a more involved and sophisticated examination of the wind forced upwelling system in the North Pacific you might seek out Parrish, Schwing, & Mendelssohn (2000). They provide a nice summary of the situation in the past two decades.

10 OCTOBER MINUTES

The upcoming 13 November SCAMIT meeting with Brian Edwards at the LACMNH was again announced and attendance was encouraged.

Next, the B'98 Review meetings were announced. The first, 27 October, dealing with polychaetes will be at SCCWRP. The second meeting will deal with Crustaceans and will be on 3 November at the LACoSAN district lab. And finally the Other Phyla, Molluscs and Echinoderms, will be reviewed at SCCWRP on 17 November.

Volume 7 of the MMS Atlas has been published and was circulated. A future SCAMIT meeting will be planned for the review of this volume.

A handout was passed around by Ron Velarde which deals with the introduction of *Caulerpa taxifolia* to Southern California. The pamphlet has photographs and text describing *C. taxifolia*, its life history, its invasive effects and what NOT to do if one sees it (disturb it). The phone numbers of agencies to call in case of any sightings are listed on the back. They are: National Marine Fisheries Service, (562)980-4043, California Dept. of Fish and Game, (858)467-4218, and SD Regional Water Quality Control Board, (858)467-2952.

It was announced that a visiting researcher, Rolando Bastida - Zavala, a Ph.D. student of Sergio Salazar - Vallejo, will be working on *Hydroides* at LACoSAN lab.

A CD Rom by Barrie GM Jamieson titled, Selected Polychaete Families and Their Feeding Mechanisms, is available and can be purchased for $14.95.

The Southern California Exotic Species Survey was covered by Leslie at the meeting. It was discovered that 90% of the ascidians encountered were introduced. In addition, *Undaria* a Japanese alga, was found to be out-competing native algal species. In all, over 60

introduced species were discovered (so far), 26 of them within the Polychaeta. Most of the day was spent looking at specimens of *Pholoe* collected during the SCX. Later on in the afternoon participants were treated to a slide show by Leslie showing many beautiful live polychaetes, mostly Syllids.

NOW IT'S GOOD?

POTW agencies, particularly the CSDLAC, are sensitized to the issue of DDT and DDT metabolites in the environment. We have dealt, and continue to deal, with a legacy of high body burdens and lingering environmental insult from discharges 30 years ago. From the monitoring perspective, DDT and related compounds are always a bad thing. This is in accordance with the position of the most of the developed world, and is behind a proposal now on the table to ban DDT production and use world-wide as part of the draft POPS (Persistent Organic PollutantS) treaty being considered by international agencies. Advocates of the ban maintain that there are other approaches for pest control more viable and less environmentally damaging than DDT use. The opponents of the ban marshal a broad range of evidence which suggests that where DDT use is curtailed or stopped in the tropics, an upswing in tropical disease - particularly malaria- follows immediately (see for instance Roberts et al 1997). They maintain that DDT should be retained for use in targeted applications, and especially for mosquito control. They do not advocate practices such as areal spraying, crop dusting, or pond spraying, but instead limited use inside homes and on mosquito netting in malaria infested regions. Those interested in this debate should be seeing references to it in newspapers and news magazines as press coverage seems adequate. A search for either DDT or malaria will yield many hits. On-line sources include journals and public opinion sites

http://www.sciencenews.org/20000701/bob2.asp

http://www.junkscience.com/ddtfaq.htm

SCX - AN OUTSIDER'S PERSPECTIVE

The last week of August, and a few days before it, brought the Southern California Introduced Species Survey (**S**outhern **C**alifornia e**X**pedition) to town. Leslie Harris, a long-time participant in surveys in San Francisco Bay and in Puget Sound, served as host. Nearly all the participants stayed at her home in Pasadena, at least while in the Los Angeles area. I had intended to participate in as many days of field work as I could during the survey, and I did. All my vacation time had been spent in the Caribbean and so I could only participate in the evenings after work. This proved a daunting labor, but a most enjoyable one.

First, there were the people, many of whom I hadn't had a chance to see for years: Jim Carlton, Andy Cohen, John Chapman, Charlie and Gretchen Lambert, and others I met for the first time. A most interesting and interested group. Working with them in the lab was great fun as there were continual discoveries ("You've got to come take a look at this...")("Oh, THAT's what that is!") going on all around. The mode of work was examination of live animals, to enable use of ephemeral color patterns, behaviors and other identification cues lost with preservation. Literature was continually a problem in non-worm areas (Leslie and the Worm lab had that covered), although each person, in addition to their considerable expertise, brought a few essential references. I tried, with modest success, to flesh out the gaps with things from my library and that at the CSDLAC. Most of the missing items dealt with crustaceans as we went through the reported biota of each part of the world trying to find the identify of some of the "new" guys. And there turned out to be plenty of "new" guys to investigate.

This was the second major attraction of the SCX. I was very surprised at the number of animals in this community that were unexpected (at least by me). The benthic community seems to change much more slowly in composition than that of this fouling/ intertidal rock/aufwuchs community. I spent a number of years examining the rocky intertidal community in Long Beach Harbor but found that the float/dock scrapings taken close to our sampling sites contained many species never encountered in over a decade of intertidal work. There were many familiar characters too, but a surprising number of forms were of interest, and probably originated on other continents.

Each evening when I arrived I would find John Chapman busily at work on crustaceans at one of the microscopes. During each field day several stations were occupied, and in some cases individual separate habitats within each station were sampled. Consequently each dish had to be labeled as to its source, since several samples were being treated simultaneously. Elsewhere in this melee several people were live sorting animals from benthic samples taken during the day and they would bring the result over intermittently in other dishes. There was usually a line of dishes beside each scope, like planes waiting to land at LAX. I would attempt to find something not yet begun by John, and begin working on that sample in parallel with him. Invariably he would find something in his dish to show me and vice-versa. While we did usually proceed in parallel, we would call each other into consultation on individual specimens. I, for instance, would shunt all encountered Corophiids to John, and received pycnogonids back in return. I'm sure the procedure looked disorganized, but it worked pretty well.

John and I usually would use the closest known local species as a "straw-man" identification, then try and find out why the specimen or specimens under consideration were not that species. John, who has been involved in these surveys for years, always operated under the assumption that what we were seeing was introduced until we could definitively identify it as a species already known locally. This helped avoid 'pigeon-holing' and kept minds from reaching premature conclusions. As the local guy I was usually on the other side, assuming it was a known southern Californian form until proven otherwise. This quasi-adversarial approach was stimulating and seemed to work well. If we were able to demonstrate that the specimens being examined didn't belong to a known local species however, literature began to be extensively used.

With amphipods, Barnard and Karaman provided us a list of species known from the world recent enough to work from. With list in hand we tried to find good descriptions of each species in the literature; eliminating inappropriate candidates one by one. Sometimes this lead us to a tentative ID, but more often we had to leave the identity unknown or suspected but not proved. With other groups of peracarids the species information was even less centralized. During each evening particularly good specimens of various species were submitted to Leslie to be photographed. A number of these shots turned out very well and added to the growing body of information on the live appearance of these animals. At the end of the evening we would preserve all the samples in preparation for receipt of another batch the next day.

While the main thrust of my involvement was with the microcrustaceans, there were questions on other groups as well. Jim Carlton or Andy Cohen would bring over a crab or a mollusk to ask my opinion of its identity. Often I had little or nothing to offer, since they only did this with the really unusual or problematic items. I had a much easier time with the things sorted out of the benthic samples, and could usually identify them. Vouchers were taken of each species encountered.

Although this was only one of a series of surveys undertaken by the core group during the summer, everyone seemed able to keep up their enthusiasm. Everybody was tired, and some began falling prey to exhaustion-based illness during the SCX. Even so, the cross-fertilization of seeing a series of different areas sequentially was useful. In several cases species seen only the week before in the Atlantic were recognized in local harbors.

Hopefully I will be able to participate more fully, including in the field, the next time the group comes to town. Working with these folks in this environment was both enjoyable and educational. I would recommend it highly to anyone who has the time and inclination to get involved.

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Southern California Association of
Marine Invertebrate Taxonomists

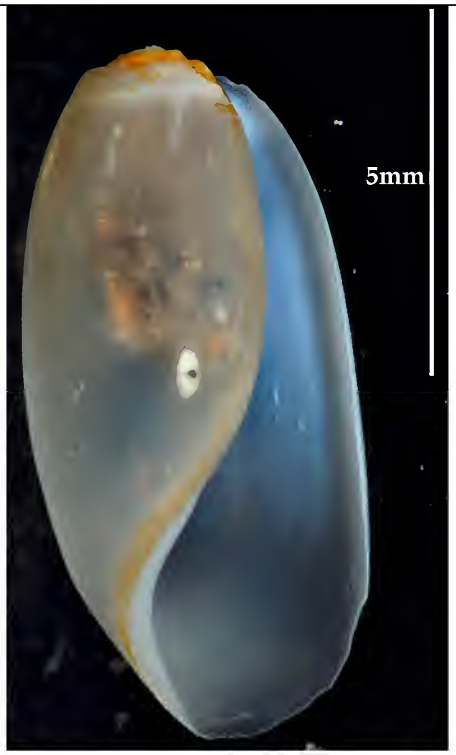
3720 Stephen White Drive
San Pedro, California 90731

November, 2000

SCAMIT Newsletter

Vol. 19, No. 7

SUBJECT:	Crustacea - Leptostracans and *Lophopanopeus*
GUEST SPEAKER:	Todd Haney (NHMLAC)
DATE:	11 December 2000
TIME:	9:30 a.m. to 3:30 p. m.
LOCATION:	City of San Diego Marine Biology Lab 4918 N. Harbor Dr. #201



Acteocina eximia (Gould 1853)
Station 2040 (1), 7-20-95, 330 ft
Photo by K. Barwick 12/98

NEXT MEETING

Todd is busily engaged in reevaluating the taxonomy of the leptostracans as part of a PEET grant under Dr. Jody Martin at NHMLAC. He would be glad to see material from any attendees, and will tell us about the latest developments in nebalian taxonomy. We also plan to discuss the decapod genus *Lophopanopeus* if time permits.

NO HO HO

No official SCAMIT Christmas party will be held this year. We are taking a bye to reevaluate the wishes and needs of the membership for "extracurricular" events. The executive committee is pondering the options which include; none, continuation of a Christmas Party in December at a new venue

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or at the Cabrillo Marine Aquarium, Christmas in July, and resumption of the SCAMIT picnic. Drop them a line with your comments, concerns, and suggestions. Oh, and have a Merry Christmas. There is always room for unofficial gatherings between socially inclined SCAMITeers during the holidays, or at any time.

NEW LITERATURE

Garm & Hoeg (2000) examine the functional morphology of the mouthparts of the galatheid crab *Munida sarsi*. They combine evaluation of shape, and setal complement with a consideration of how each portion interacts functionally with the others. Some of their description of function is based on observation rather than inference; they took and examined high-resolution video of the feeding action itself. The SEM's the authors provide of setae and intact mouthparts are stunningly detailed, and absolutely clean. It becomes more and more apparent that the fine structure of the arthropod cuticle, and the setae, scales and spines is richly detailed, and serves as a good hunting ground for interesting character states; both from structural/functional and taxonomic standpoints.

Picturing a crab we think of claws; the massive crushing pliers of stone-crabs, the efficient plant nippers of grapsids, the waving semaphore claws of fiddler crabs, or the blood-letting pointed pinchers of portunids. Mariappan et al review the range of structures and uses in crab chelae, as well as questions of allometric and non-allometric growth, handedness in non-symmetrical cheliped development, and cheliped use in social encounters. A useful compact review which serves as a key to recent literature on chelae-related morphology and ecology.

One of the more interesting things that decapods do with their chelae is produce sound. Versluis et al (2000) investigate the actual process of sound generation in the alpheid shrimp *Alpheus heterochaelis*. In this species they found that the snap of this snapping shrimp was produced by the sudden collapse of a cavitation produced bubble. The sound generated is truly staggering in its intensity, but the intensity drops off fairly rapidly with distance. Myriads of these and similar shrimp turn the sea into a white-noise saturated medium. It is likely that some other species, with different chela morphology, produce sound in other ways. The present case is well documented however and the sequence of events leading to production of the sound is clear.

Gnathiids are odd gnome-like isopods with peculiar life-histories and a composite life-style; parasitic as juveniles and free-living as adults. Most descriptions are not complete, opting instead for definition of only those characters which allow separation from local congeners. Like other large genera, what were originally considered subgeneric groupings have been raised to full generic status. In consequence, most "Gnathia" are now in other genera. This is true in California where our most common gnathiids are now in the genus *Caecognathia*. Smit et al (2000) provide a detailed description of another member of this genus from South Africa, providing a good basis for comparison with local species. Their paper continues what has been, in recent years, a large upswing in literature on the family, both taxonomic and ecological.

OLD LITERATURE

In the last Newsletter we mentioned a series of publications revising the gastropod fauna of the North Atlantic. This time we revisit a massive, but under-distributed contribution to the knowledge of the isopod fauna of the North Pacific. Four volumes have appeared to date (Kussakin 1979, 1982, 1988, 1999). All these works are in Russian and like most such literature are hard to acquire and little used in the West. The exception to this is the program of joint US-Israeli publications (the ISTP or Israel Scientific Translation Program) which

harnessed the power of expatriot russians to broaden access to important works by translating them into English. I don't think the program still exists, but during its run a number of important monographic treatments were translated for use in the west. Our Soviet colleagues received considerable government support (at least in the USSR era prior to the impacts of arms and space expenditures coming home to roost), and major oceanographic expeditions such as the cruises of the Vityaz provided vast collections for description by a number of researchers. Many world experts were involved, among them Dr. Kussakin.

I first actually viewed these volumes during lab work on the SCX collections at the Natural History Museum. John Chapman had brought a set with him. At the time I had ordered the volumes from an English source, but had not yet received them (I am still waiting to receive the 1988 publication). When Rick Brusca left the Natural History Museum he took his set with him, therefore, my set is probably the only one outside a library in Southern California. I'm sure they can be found in the Hancock Library, and at Scripps, perhaps at UCLA, but probably not elsewhere. Mine will be available for use by local members and I will be happy to answer questions addressed to me via e-mail or telephone regarding their content (although please remember I don't read Russian).

A number of species which occur in the North East Pacific are included, but perhaps even more useful are the taxa not currently known to occur in our area. As commerce with asian Russian ports increases, and as species introductions continue, we should find more of the species covered in these Kussakin works showing up in our waters. Like Michel Hendrickx publications on decapods from Mexico, these works help us explore the wandering boundaries of our fauna.

THE CONNECTION

In a series of papers over the last few years Michael Veccione, Bruce Collette, and various colleagues have explored the connections between taxonomy and fisheries biology (Collette 1995; Vecchione, 1994; Vecchione & Collette 1994, 1996; Vecchione et al, 2000). There does seem to be a connection through biodiversity. Fisheries biologists are busily trying to simultaneously find the most efficient way of exploiting the natural world and the least damaging way of doing so. Sometimes they attempt to go too far afield, using data from other areas to establish best population management approaches. Here taxonomy comes in, clarifying similarities or differences between organisms believed to be the same in various parts of a large range.

The authors are staff members at the National Systematics Laboratory, part of the National Marine Fisheries Service. The laboratory is housed at the Smithsonian and has, for over 50 years, offered taxonomic support for fisheries investigations in this country. Most of the work has been with commercial species of fish and invertebrates, but many non-commercial groups have also been addressed. Partly this is a recent change in emphasis which occurred when both the public and regulators focused more forcefully on biodiversity. There continues to be a need for taxonomy in the service of fisheries management (for instance the lobster tail issue described by Vecchione and Collette 1996), but evaluation of biodiversity has become a priority. Taxonomy is central to this effort. It is important in many other related biological disciplines as well (see Vecchione 1994) where it is needed to guarantee experimentalists are using the same organism in all portions of their experiments. In a sense, taxonomy is to other biological disciplines what particle physics is to other physical disciplines; the basis on which everything rests.

SEDIMENT WORKSHOP

On the 24th and 25th of October a workshop was held on-board the Queen Mary entitled "Collection, Analysis, and Interpretation of Sediment Quality Data. It was put on by SCCWRP and the San Diego, Santa Ana, and Los Angeles Regional Water Quality Control Boards. Over two days those present attended presentations from a variety of notable scientists working in sediment quality assessment. The topics covered the entire process, from the design of environmental monitoring studies, to application of analyzed results, to problems of remediation site selection. On the second day most of us participated in an exercise designed to draw on the presented concepts to solve a real-world problem involving time constraints, budgetary limits, and politics. I'm sure that all the participants learned something they did not know, regardless of the amount of experience with which they arrived. As with most meetings, one of the major benefits was the ability to talk to both the speakers and other participants during breaks and over lunch. Questions were encouraged throughout the process and in response, extensive comments were returned by some of the speakers . A broad spectrum of environment related employment was represented among the participants, drawing from dischargers, regulators, academia, and consultants. All the major POTW staffs were represented, and a number of SCAMIT members were participants. Steve Bay of SCCWRP was the major organizer of the event and should be congratulated on its success.

On the 23rd SCCWRP put on their own orientation session designed for those who normally see only data and don't get into the field. Live benthic samples from several different habitats were available for observation. We observed how the samples were organized and the various animals that were present. Preserved samples from a series of sites and sampling dates off Palos Verdes were also examined. The aim was demonstration of the degree of variability one might expect within benthic samples from different habitats, and under various degrees of impact. Fortunately Dean Pasko (CSDMWWD) was on hand to tell the participants what that was that just whizzed past their eyes under the microscope.

SYNOPTIC DATA REVIEWS

Preparation of the B'98 infaunal data approaches closure. The synoptic data review has been completed and once the final threads from that process are knotted together the database will be complete. We can then begin data analysis. Data submissions took longer than anticipated and so we are later in the year than originally scheduled for preparation of the analytical dataset.

Hopefully analysis and interpretation will be more rapid this time, as development of analytic tools - particularly the BRI - required many months during analysis of the SCBPP data. We hope to be able to use existing tools this time, rather than creating new ones.

This time around the synoptic review process has been much easier than that during preparation of the SCBPP data. All three meetings have gone well, with nearly everything resolvable during the meeting. Each time there is a small residue of action required of one or more participants, usually involving reexamination of a very limited number of specimens. These instances are usually to clarify if one or more participants were viewing things in the same manner as others. If at the meetings we think that a brief examination will allow data to be retained at a more fully identified level, and if the persons concerned are willing and have the time, decisions will be held in abeyance until such examinations take place. The process must move forward, however, and if no response is received within a week or two, a default solution (usually a lumping to generic or higher level) will be implemented. Many more species

level identifications could be retained in B'98 data than in SCBPP data. This is in part, due to the advances in knowledge which have occurred in the interim. It is also due to our better understanding of how to deal with taxonomic uncertainties in the database, and our increased familiarity with the entire review process.

WEMAP

Completion of the QC analysis of the WEMAP (Western Environmental Monitoring Assessment Program) samples taken last year is nearly complete. Once the data are groomed (elimination of animals represented by too few individuals, ambiguous higher level taxon IDs, and forms with taxonomic problems) they can be analyzed. Work on this project has benefitted from our experience in southern California with the SCBPP, and with B'98. This has allowed more rapid processing of the samples and should yield a shorter period between field sampling and final report. Once data is available, it will be interesting to compare the results of the inshore samples taken in B'98 with the samples taken throughout California, Oregon, and Washington in the WEMAP program.

THE REAL ARTICLE

(Editor's Note: The article below is reprinted, with permission, verbatim and appeared recently at:)

http://chronicle.com

"The Impending Extinction of Natural History
By DAVID S. WILCOVE and THOMAS EISNER

Imagine you are a naturalist with a liking for insects. You are interested in how insects make a living, in how they are fit for survival. You marvel at how protected they are as adults, when they are able to fly. And you think of how helpless they are as eggs and pupae, when they are stuck in place, unable to take evasive action. True, pupae are sometimes enclosed in protective cocoons, or hidden in dugouts in the soil, but some live out in the open, where they are exposed to a world of predators. How, for instance, do the pupae of ladybird beetles (family Coccinellidae) manage

to survive? They are typically affixed to stems or leaves, where one would imagine they don't stand a chance against ants. Might they have special weaponry? You look closely and find that they do. They have what are essentially biting devices, in the form of clefts along the backs of their abdomens that they can open and close and use to snap at ants that come too close.

As a naturalist with a Darwinian bent, you wonder whether such snapping devices are present in every ladybird-beetle pupa or whether, in the best evolutionary tradition, different ladybird species have come to possess variants of this defense. You look at different species and find that, yes indeed, the beetles of one genus, Epilachna, which includes among others the Mexican bean beetle and the squash beetle, have evolved a remarkable alternative defense. Instead of the pinching devices, Epilachna pupae have a dense covering of tiny glandular hairs, the secretion of which forms a potent deterrent to ants.

You get in touch with chemists, whom you provide with a sample of the secretion, and in due course you find out that you have stumbled upon a unique group of chemicals. The substances include some fascinating new ring structures of enormous size — so novel, in fact, that the paper you eventually write on the secretion with your colleague chemists attracts wide attention.

The discovery may look serendipitous, but it was not. It was driven by rational inference from pure, old-fashioned natural history, the close observation of organisms — their origins, their evolution, their behavior, and their relationships with other species. That kind of close,

scrupulous observation of nature has a long and illustrious history, but it is now sliding into oblivion.

The scenario we describe actually happened to one of us (Thomas Eisner). The impending extinction of natural history is very real as well. In schools and universities, in government agencies and research foundations, natural history has fallen out of favor. What was once considered a noble field of inquiry — no less a figure than Charles Darwin proudly called

himself a natural historian — is now viewed as a relict discipline, a holdover from the era of Victorian cabinets and private butterfly collections. A knowledge of, or even an avowed interest in, natural history is no longer a prerequisite for admission to a graduate program in ecology or any other branch of biology. Financial support for basic natural-history research has all but evaporated. Even the field trip, long a staple of science education from the primary grades through graduate school, has become increasingly uncommon.

This deinstitutionalization of natural history looms as one of the biggest scientific mistakes of our time, perpetrated by the very scientists and institutions that depend upon natural history for their well-being. What's at stake is the continued vibrancy of ecology, of animal behavior and

botany, of much of molecular biology, and even of medicine and biotechnology. A knowledge of natural history enables the professional ecologist to see functional relationships in nature, to uncover the broader patterns that lead to critical scientific advances.

Natural history also provides the "nuts and bolts" information necessary for managing wildlife and other natural resources. As the president of the Society for Conservation Biology recently lamented, "How can we possibly

construct ... a successful recovery plan for an endangered bird when we lack basic information on such things as what it eats, where it nests, and so on?" For the molecular biologist, natural history is often the path to finding something truly strange and wonderful, like the elaborate chemicals that protect the pupae of certain ladybird beetles. Even the search for new medicines can benefit from natural history. Was it not in his capacity as a natural historian that Alexander Fleming saw

significance in the observation of a zone of bacterial inhibition around a Penicillium mold growing in a petri dish, a discovery that launched the era of antibiotics?

Perhaps the strongest argument in support of natural history is simply the magnitude of our current ignorance about nature. To date, scientists have discovered and described approximately 1.5 million species. That tally represents only a small fraction of the total number, perhaps less than a tenth. Even in the United States, where approximately 200,000 species (terrestrial, freshwater, and marine) have been described to date, an additional 100,000 to 400,000 may await discovery. And only a tiny fraction of the described species have been studied in any detail. Given how little we know about nature, it hardly makes sense to discourage its further exploration.

Several factors have contributed to the demise of natural history. As any field of scientific inquiry matures, it has a tendency to become more theoretical. Previously unconnected observations are brought together under the mantle of a set of unifying principles. Scientists who

contribute to that body of theory emerge as the leaders in the field; they are the ones who are hired by research universities, who receive tenure, and who then encourage their graduate students to follow in their footsteps. (This is not to say that one cannot be both a first-rate

natural historian and a first-rate theoretician, but such individuals are the exception rather than the rule. Most scientists tend to be strong in one or the other.) No one can blame the universities for wanting to hire the rising stars in each discipline, but with respect to the natural sciences, the practice has led to an unanticipated but regrettable result: The traditional natural historian has been pushed to the margins of academe. Moreover, the institutions that finance scientific research, be they governmental or private, are drawn to the leaders in any given field and may wrongly assume that the natural historian has comparatively little to contribute. Unable to obtain support for their research, the natural historians drop even lower in the academic pecking order.

At universities, the key to reversing the situation lies in hiring (and eventually granting tenure to) scientists with an abiding affection for natural history. Unfortunately, a Catch-22 applies here. Administrators and senior professors who are uninterested in or even hostile to natural history are not likely to value it when judging candidates for junior faculty positions. And without access to entry-level positions, a new generation of natural historians will never emerge to become tomorrow's administrators and senior faculty members. The institutions that pay for research, however, could assume a leadership role in rescuing natural history. Were more money available for basic natural-history studies, we are convinced that more graduate students and faculty members would incorporate natural history into their researching and teaching.

An even more fundamental step would be to reinstate natural-history studies in elementary and secondary schools. Most children are fascinated by plants and animals — from dandelions to dinosaurs. That seemingly innate interest, if nurtured by adults, can become a lifelong joy or even the path to a career. Untended, it usually atrophies as a child grows older. For the price of a stereo microscope, now less than $250, a science teacher can turn a pinch of soil into a bustling world of springtails, oribatid mites, and nematodes, creatures as bizarre and engaging as anything to appear in a Star Wars movie.

The current push to connect every classroom in America to the Internet demonstrates how quickly elected leaders and the public can be galvanized to address what is rightly perceived to be a critical educational need. Meanwhile, the demise of natural history goes unnoticed, increasing the likelihood that future generations of schoolchildren will spend even more time indoors, clicking away on their plastic mice, happily viewing images of the very plants and animals they could be finding in the woods, streams, and meadows they no longer visit."

David S. Wilcove is senior ecologist at Environmental Defense. Thomas Eisner is Schurman Professor of Chemical Ecology at Cornell University.

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THE DEEP END

There has recently been some scuttlebutt [yes, it really is a word, and has some appropriate contexts for use - as here] about examining the biota of the basins which stud the Southern California Borderland like so many negative raisins in a positive fruitcake. Should some such activity be undertaken regionally, we might all be able to get a glimpse of a seldom seen fauna. There is a baseline of sorts provided by investigations of the Allan Hancock Foundation. Publications resulting from sampling in the basins in the 1950's (Hartman 1955, 1966; Hartman and Barnard 1958, 1960) provide evidence of a sparse, but interesting biota. Most samples were from nearshore basins, but limited sampling was also performed further offshore. A parallel study dealing with the fauna of submarine canyons is relevant to any basin effort, as many of the residents of the deeper portions of submarine canyons also frequent basin habitats (see Hartman 1963, Schultz 1966, Barnard 1966). Many portions of the Taxonomic Atlas of the Santa Maria Basin and Western Santa Barbara Channel also apply to the biota of the borderland basins.

Basins are actually fairly varied habitats and some, especially those far off-shore, have a partially endemic fauna. The near-shore basins have been most frequently and thoroughly investigated; after all, ship time is expensive. And not all research ships can function well in sampling of the basins. The main problem is depth. Carrying enough wire and large enough winches to handle it is not a task for a small craft. None of the monitoring vessels used along the coast has the capability of sampling the deepest basins, and benthic sampling in even the shallowest, stretches the capability of any. A regional program sampling in the basins would depend on availability of the larger vessels in the SIO, Navy, or NOAA research fleets.

There would be much to communicate in this portion of the Newsletter if regional monitoring did venture into deeper water. We would be considering taxonomic problems and solutions as yet unattempted among our members. Not that we are totally unfamiliar with the deeper fauna, it is just less familiar than that of the shelf. It is also considerably less dense and we should probably be looking to either a different benthic sampling strategy involving a biological sled, or a compound strategy of qualitative sampling with a sled, and quantitative sampling with a box core. Based on early sampling of the various basins the average density is only 39 individuals/m2, with a peak of 117/m2 recorded in the Santa Catalina Basin. Single samples in the West Cortes and San Nicolas Basins yielded only 12 macrofaunal organisms/m2 on a 1mm screen.(Hartman & Barnard 1958). A later expansion, which added half again as many samples (Hartman & Barnard 1960) yielded an average of 47/m2, still less than five animals per 0.1m2 Van Veen sample. Biosled samples cover many meters per tow and offer a better chance of getting both the rarer species, and sufficiently large samples to provide identifiable specimens (i.e. mature, complete, etc.). Use of a finer screen would also increase both the volume and diversity of the catch. I'll keep my fingers crossed.

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Southern California Association of
Marine Invertebrate Taxonomists

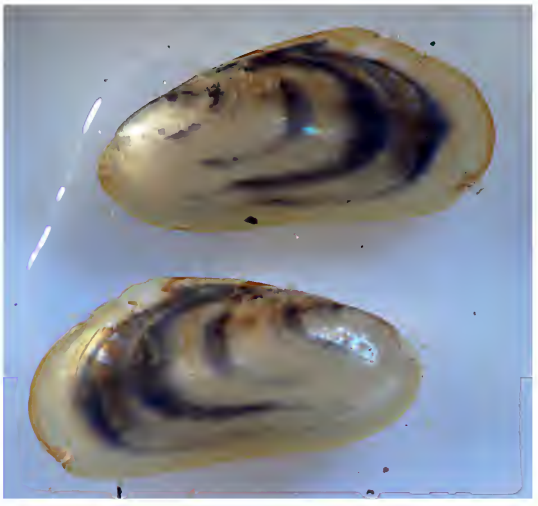
3720 Stephen White Drive
San Pedro, California 90731

December, 2000

SCAMIT Newsletter

Vol. 19, No. 8

SUBJECT:	Polychaeta: Autolytines
GUEST SPEAKER:	Arne Nygren (Univ. Goteborg, Sweden)
DATE:	8 January 2001
TIME:	9:30 a.m. to 3:30 p. m.
LOCATION:	City of San Diego Marine Lab 4918 N. Harbor Dr, Ste 201



Mytilus sp., approximately 4.5 mm
ITP Regional Station 2708(2), 7/17/00, 37 ft.
Image by K. Barwick, 2/27/01

NEXT MEETING

The next SCAMIT meeting is 8 January at the San Diego Lab. After a talk on autolytines by Arne Nygren (Uni. Goteborg, Sweden), we'll be discussing the smaller chapters in MMS Atlas Vol. 7. These chapters and their authors in the order we'll discuss them are: Fauveliopsidae by Blake & Petersen, Sternaspidae by Petersen, Acrocirridae, Scalibregmatidae, Opheliidae, Flabelligeridae, and Oweniidae by Blake, and Trichobranchidae by Hilbig.

The Fauveliopsidae and Sternaspidae are short and very well done, and we should be able to cover these quickly. I don't expect much discussion on Acrocirridae, Scalibregmatidae, or Opheliidae. Flabelligeridae, Oweniidae, & Trichobranchidae will provoke a much greater response and will take the longest. Please come prepared with your comments, corroborating literature, evidence, etc., so we

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can cover as much as possible during the day. It would be great if we got a majority of the local polychaete people at the meeting so we could get a solid consensus on each decision.

Families not covered during the day will be added to the agenda for the 2-day SCAMIT meeting 12-13 February. We'll be trying to get through the Ampharetidae & Terebellidae as quickly as possible to speed up completion of SCAMIT species list 4. The capitellid chapter and any remaining families will probably be covered at the March meeting on the 19th at the San Diego Lab. The meeting will be led by Karen Green, who has recently spent a considerable amount of time reexamining the capitellids in the process of preparing a treatment of the Capitellidae of Thailand.

[Editors note: this announcement was left as originally written, although subsequent delays have rendered a good portion of it obsolete]

NEW LITERATURE

Karakassis and Hatziyanni (2000) analysed benthic disturbance from fish farm organic enrichment. The twist here is that they analysed how interpretations of the data differ at different levels of taxonomic resolution. Were the results different if data were only considered at the family rather than the species level? And what about data transformations, was there an interaction with level of identification? The answer in both cases was yes. While demonstrating that cost-benefit analysis could help in allocating scarce resources, the authors maintain that the preferred level is always to identify to species. They show that if analysed as if they were separate samples, different levels of taxonomic resolution track information loss across multivariate analysis plots. When the interaction with data transformation method is simultaneously represented we find the full identification ends of these tracks cluster more closely than the phylum level ends. The authors examined three cases, one heavily enriched, one moderately enriched, and one with scant evidence of enrichment.

While past reports have indicated that Phylum level analyses were adequate to distinguish heavily impacted areas from reference areas, the present authors show that the greatest disparity in effect of data transformation was at the strongly enriched site. Thus, while species level identified data treated under different transformations all clustered tightly in multivariate space, the phylum level identified data spread widely through the space depending on the transformation applied. This is but the most recent in a series of investigations exploring the impact of taxonomic resolution. With money scarcity dictating declining expenditures in most if not all cases, more discussion of the issue will be forthcoming. Of course, the taxonomic resolution question assumes the ability to accurately distinguish species during species level analysis.

The cosmopolitan vs. cryptically speciated debate is rejoined in the cases of two interstitial polychaetes by Schmidt & Westheide (1999). A split decision ensued, with examined populations of "*Stygocapitella subterranea*" from the Mediterranean, the U.S. East coast and the U.S. West coasts being genetically distinct. The authors suggest each should receive full specific status based on the degree of their genetic differentiation.

Examined populations of *Hesionides arenaria arenaria*, however, proved indistinguishable over a broad geographic range. This tiny worm proves to be a valid taxon with a very broad distribution. How this was established and maintained remains to be demonstrated, although anthropogenic influence in distribution of a sandy beach interstitial polychaete seems unlikely.

At a higher level Purschke, Hessling & Westheide (2000) discuss annelidan relationships based on recent phylogenetic analyses. Their particular focus is on absences used in character analysis, and the different results yielded by different interpretations of absence. They provide data which suggests that some absences are apomorphic, and represent loss of common structure in some clades rather than acquisition of characters previously not present (the plesiomorphic interpretation of absent characters in many cases). In particular they provide evidence that segmentation has been lost in Echiura, based on analyses of neural structure of larvae and young animals. They found clear evidence of repeated paired neural structures in several species which would suggest segmentation whose surface indications had been lost. This neural evidence is also lost by the time maturity is attained. The authors did not pursue the phylogenetic consequences of viewing lack of segmentation in echiurans as a shared derived character, preferring to address that in a subsequent publication.

Ernst Schrödinger must be chuckling in his grave (although we can't know this for sure). Collie, Escanero & Valentine (2000) provide more data indicating that trawling damages the bottom and effects our view of the community. The present paper confirms and extends the information provided by the same authors in an earlier paper (Collie, Escanero & Valentine 1997), as well as analyses provided by many others in the last few years. From the standpoint of fisheries and sustainable yield it is important to understand how the act of fishing itself impacts the carrying capacity of the exploited habitat. From the monitoring standpoint it is important to realize that with frequent trawling of the same areas, we are modifying the community whose structure we seek to document. As the frequency of sampling and/or the precision of trawl track reoccupation are increased, so is the distortion of our view of the community. Recognition of this "observer effect" is half the problem, now we just need to figure a way around it.

Although treated previously as part of a review of the bivalve mollusk family Psammobiidae in the Eastern Pacific (Coan 1973) the genus *Gari* was recently reexamined (Coan 2000) to address problems left unresolved in the earlier paper. Results of examination of new material and new research by others after 1973 were included in the recent monograph on bivalves of the Northeast Pacific (Coan, Valentich Scott & Barnard 2000) for *Gari* species within the coverage area. This paper, then, proposes no changes to our existing approach to the genus. It does, however, provide considerable additional information and discussion of the species involved, their relationships to taxa with Panamic ranges, and a series of useful visual comparatives of the seven recent species in the genus.

On hearing the title of Helmut Debelius' book, Crustacea of the World (1999), my first response was "Yeah, Right; the crustaceans of the world in 321 pages!". My doubts proved well founded, only some of the crustaceans of the world are covered here. As Lipke Holthuis pointed out in the Foreward, the title should include "Vol. 1". Even so, quite a bit of territory is covered in this volume, and a wealth of interesting discussion and observation is reported. Those used to seeing only preserved specimens of the various crustacean species will be stunned by the magnificence of the animals in the live photographs which comprise the majority of the book. Debelius is, though a professional decapod worker, also an *amateur* [in the best sense of that term], and his love of his subjects comes through in his text. Some California forms are treated but the majority of the covered species are from tropical climes.

Another import item was also reviewed at the meeting, a Japanese opisthobranch faunal report by Suzuki (2000) on the Izu Peninsula. This is the long peninsula which separates Sagami Bay from Suruga Bay on the East coast of the island of Honshu. Despite all the attention paid to the fauna by Baba in his Opisthobranchia of Sagami Bay (1949) and the supplement to it (1955) there still remain a large number of undescribed species pictured in Suzuki's book. Many of these are quite strikingly colored and patterned, so should be quite visible to the observer. A number of cryptic species are probably also present. One of the more interesting aspects of this book is the documentation of change with growth it provides. Photographs of juveniles at several stages of development are available for some species. Variability in adult morphology and pigmentation is also documented in groups of photographs for some species. While the Japanese text is likely to be opaque for most users, the photographs are captioned in English, and an English Index to Scientific Names is also provided. There is a very slight overlap between the fauna covered in the book and that of the West coast of North America. The main appeal of the book to California workers is the WOW value; a number of truely outlandish and amazing species are resident in the area covered. Of course, if you are planning a diving excursion to this part of Japan the book is a must. It is available from Sea Challengers and probably elsewhere, although searches on mainline web book sources came up empty.

Mention was also made at the meeting of a report now available which should interest members (Thompson, Lowe and Kellogg 2000).

13 NOVEMBER 2000 MEETING

The meeting commenced with Brian Edwards giving us an overview of the collection methods and equipment used to gather the photographs and videos we would be perusing. The box core used to collect sediment samples had been fitted with a still camera that would snap a picture 2m before the corer touched bottom and sampled. The majority of the pictures examined, however, were taken by a camera sled. The camera sled was equipped with both a 35mm still camera and a video camera. While video was rolling the still camera flashed pictures approximately every 30 seconds. The transects we were viewing via video and still images were all in Santa Monica Bay at various depths and areas. Brian commenced this introduction as a number of persons expected had not arrived by 9:30. Once everyone was present, we took a brief break to deal with SCAMIT business before actually starting the process of viewing video and examining pictures.

Ron Velarde had the floor first and announced the next SCAMIT meeting will be on 11 December at the City of San Diego's Marine Lab. Todd Haney from UCLA will be speaking on the subject of Lepostracans (*Nebalia*). People are also encouraged to bring questions/specimens of *Lophopanopeus*. In addition, Ron is calling for anyone who is reporting *Eualus lineatus* to bring specimens, as he suspects that is not the species we are actually seeing. The goal is to finish up the meeting by 2:00 or 2:30 at the latest so that attendees can join Bonnie Becker at the Cabrillo Marine Monument in her efforts to inventory the tide pools.

Next Ron announced that this year's Christmas party has been canceled. There will be a party of some sort in the spring or summer, hopefully at some outdoor venue such as a park or at the beach.

Leslie Harris then announced that she is translating, from the original German, the recent thesis monograph on *Typosyllis* by Frank Licher. She is not attempting the whole work at this time, but only the comparative

tables and the discussions of species from our local waters. Those interested in this information should contact her concerning its availability.

It was suggested that the January meeting should address the issue of reviewing Volume 7 of the MMS Atlas series. Don would like to see this volume reviewed before he completes and publishes edition 4 of the SCAMIT Species List. [It will take several months to adequately consider this volume, and meetings have been scheduled].

And Finally, Larry Lovell, it seems, is spending some time down "south". He joined an expedition to the Antarctic and had sent an email to Ron detailing the first few days of his journey. We hope that he will continue to send email updates which we can print as installments in upcoming newsletters [see "Out in the Cold" later in this issue; the first installment of Larry's communiques].

Following our business meeting we began reviewing film and still pictures, and continued doing so through the day. A list of the species identified was prepared and sent to Brian, who was most appreciative of the input he received. It was also a great treat for those present to view animals in action and in situ. We hope to repeat this experience again. It was suggested to Brian that an efficient method for him to glean input from many, without accumulating a lot of frequent flier miles, would be to burn a CD of particularly good images and circulate it through our group, allowing each to annotate images on which they had an opinion.

11 DECEMBER MEETING

The morning began with Ron Velarde discussing upcoming meetings. The next meeting will be on 8 January at the City of San Diego Marine Lab. Syllids and other polychaete groups from the MMS Atlas Vol. 7 part 4, will be reviewed. The following meeting is scheduled for two days, 12 and 13 of February. It will be held at the Los Angeles County Museum of Natural History where the review of the polychaete groups covered in MMS Atlas Vol 7, part 4 will continue. It is the general hope that the review will be complete at these gatherings, but if not, the same topic will persist at the March meeting.

Leslie Harris had the floor next. She and Todd Haney, along with a handful of other scientists, participated in a survey of the intertidal fauna at the Cabrillo National Monument organized by Bonnie Becker. In the past, studies have been conducted on specific target species in the rocky intertidal, with most of the animals being large, obvious and well known. Therefore, Leslie concentrated on looking at smaller organisms previously lacking in study and inventory (mostly polychaetes and small crustaceans). Jim Lance participated as well and had information dating back as far as 1953. One notable trend was the decline in the number of species of nudibranchs.

The taxonomists who participated in the survey will provide a species list of the animals encountered. All samples collected will be deposited at the Los Angeles County Museum of Natural History. Leslie found this exercise productive and interesting and encourages others to contact Bonnie (Bonnie J. Becker, Natural Resource Science, Cabrillo National Monument, 1800 Cabrillo Memorial Drive, SD, CA 92106-3601, 619-557-7308, Bonnie_Becker@nps.gov) and offer their services. Bonnie herself dropped in during the meeting to introduce herself and alert the membership to the possibility of a productive partnership.

With that, the business portion of the meeting was concluded and Todd Haney began his presentation. He reviewed the current status of the leptostracans of the world, commenting on the higher level taxonomy of the group, and then proceeded to our local fauna. We currently have 4-5 taxa known from the West coast of North America; *Nebalia pugettensis*, *Nebalia daytoni*, *Nebalia hessleri*, *Nebalia n.*

sp. (In press), an as yet undescribed deep water form, and an as yet unnamed form from Puget Sound. The first of these taxa requires two things, selection of a lectotype, and description of the second species of *Nebalia* which co-occurs with *N. pugettensis* in the Puget Sound area. Once this has occurred we can further evaluate the status of *N. "pugettensis"* in the Southern California Bight. There are probably more species to come and Todd is actively collecting from shallow muddy areas up and down the coast. He is also finding a number of other new taxa in museum collections, and during Guana Island research trips to the British Virgin Islands. Things are heating up in leptostracan taxonomy as both Todd and a researcher in Australia attack the group.

Most of our local species can be distinguished based on structure of the eyes and rostrum. There is also considerable divergence in the structures of the first abdominal appendage. Todd pointed us to the PEET area of the Natural History Museum website

http://www.nhm.org/~peet/

where he has assembled a considerable amount of information on the group, including keys and summary of the described species.

Don Cadien brought live crustaceans that he had collected during the survey. These animals were viewed with much enthusiasm as live material is, unfortunately, so rarely seen by most of us. Examination of Pt. Loma intertidal arthropods taken Sunday by Don, began with phoxocephalid amphipods from intertidal sand pockets. Examinations continued with commensal isopods from *Strongylocentrotus purpuratus*. These were reviewed by member Tim Stebbins, who found they were *Colidotea rostrata*, the species on which his masters work focused. Characterized by commensalism with the urchin, and uniform blackish red pigmentation with very pale coral pink tips to antennae (which look like tube feet of the urchin when viewed in situ), these animals are very distinctive.

Next viewed were commensal amphipods taken from the underside of the large intertidal limpet *Lottia gigantea*, between the side of the foot and the underside of the mantle. Dark green in life, mottled green when examined under the scope, these look to be *Allorchestes*, or other hyalids - not pontogeneoid or other groups such as isaeids that have known intertidal commensal relationships. Search of available literature yielded nothing definitive, although Barnard has mentioned in at least one publication that hyalids are commensal associates of some limpets. If anyone can add to this please contact Don Cadien at **dcadien@lacsd.org** or via telephone, (310) 830-2400 x 402.

Recently, local *Eualus* species were reevaluated, and a species previously relegated to synonymy was revived by Jensen & Johnson 1999. They discovered that *E. subtilis* of Carvacho & Olson 1984, which had been confused with and synonymized with *E. lineatus,* was reliably differentiable.

Ron Velarde distributed a comparison table he prepared to help him distinguish *Eualus lineatus*, *E. pusiolus*, and *E. subtilis*. Only the first and last occur in the southern California Bight, *E. pusiolus* being found further north. Even *E. lineatus* seems mostly restricted to the area in the northern portion of the Bight, with *E. subtilis* in the central and southern portions. Ron has examined all material initially identified as *E. lineatus* in the San Diego program, finding them to be *E. subtilis* without exception. The same was true of material collected off Palos Verdes in the LACSD voucher collection, which he kindly evaluated. The sheet is appended here to allow others to perform their own reevaluation of specimens previously reported as *E. lineatus*.

Dean Pasko discussed the amphipod genus *Rudilemboides*. He and Tony Phillips compared notes and came to the conclusion that there were two undescribed species in our area and that all three species were differentiated in habitat. *Rudilemboides stenopropodus* was found in bays and estuaries, *R.* sp. SD 1 was found offshore on open mainland coasts, and *R.* sp. HYP 1 was found in coarse inner shelf sediments of low organic content in the northern Channel Islands. Dean has examined specimens reported from off Palos Verdes by CSDLAC as *R. stenopropodus*, and found them all to be his *R.* sp. SD 1, matching the distribution found for species in the San Diego area.

Dean also contributed some new observations in the continuing saga of *Americhelidium*. He circulated a sheet describing some differences in material he was seeing from the typical *Americhelidium shoemakeri*. Perhaps most striking was that one of the two forms had paired dorsal setae on pleonites 2 & 3 and on urosomite 2. One must apparently look carefully for these as they are not large, dark or thick. Differences were also noted in the second gnathopod, the uropod 3 ramal spination and uropodal proportions, the posterior marginal setation of coxa 2, and in the basis of P7.

We continue to work on sifting through the morass of variability in this genus, searching for the idlands of stable character states which will tell us (hopefully) whether, in the genus locally, we have 3 or 30 species. All contributions and observations are welcome.

OUT IN THE COLD

Member Larry Lovell recently took part in an expedition to the Antarctic Peninsula, sub-Antarctic Deception Island and environs in the South Atlantic. He sent back reports via e-mail which were enjoyed by many. He has allowed SCAMIT to release these to a larger audience and they will appear in the next few newsletters. Larry himself has returned unharmed among us. Thanks to him for providing us a vicarious experience hard to come by.

"Today was just the greatest. A beautiful mostly sunny day cruising the Antarctic Peninsula. We are ahead of schedule and Palmer Station does not want us arriving until tomorrow morning, so the captain took us through some really beautiful areas to see the sights. I have never, ever seen so much snow and ice and to think this is just one small area of Antarctica. They say 90% of the earth's fresh water is frozen here. Antarctica is the highest, driest, and coldest continent. The temp was around -1.0 degrees C most of the day and down to around -18 with the wind at times. I shot 4 rolls of film and shot about 1 hour of video tape. There were some really beautiful icebergs with blue ice around the edges. Mountains with exposed sides and then ice covered, what a contrast. We saw several penguin colonies and a few whales. There were also several small research stations on shore. Very isolated and nearly always by a penguin colony. You can tell where the penguin colonies are from far away by the orangish stain (from krill, their main diet) left by their excrement. They climb very high up the hillsides and you can see the trails going up. We saw some penguins swimming, too.

Yesterday we off-loaded four American (NOAA) scientists going to Cape Shirrif (sp.?) on Livingston Island. There were two zodiacs taking equipment and supplies ashore. Several of us got to go ashore to help. There were male fur seals (also one penguin, a Weddel seal and two elephant seals) already on the beach near where we were landing. We had to go through and around several seals to sled supplies to the camp, sometimes as close as 10 feet away. There were about 8-10 zodiac loads of gear including food and lab equipment including a microscope. I was charged by a fur seal briefly, but he stopped when I yelled and clapped my hands together. I took some video

and pictures there also. The wind started to come up, so we had to leave before we were ready. The trip back to the ship, into the wind, was exciting with a few big bounces. It was nice to get off the ship and ashore for awhile. The four Americans will be joined by several Chilean's to spend 4-5 months studying the seals and penguins that will breed and have their young there. They will attach sensors to some that will track the females while they are at sea feeding and record the location and depth of their food foraging. They will also pull a small tooth from a few to age them just like tree rings. Also, milk from some females will be collected and analyzed for nutritional content. Apparently they have done the lab work and can tell from the chemical makeup what they have been feeding upon.

The last two days have been much calmer and any thoughts of seasickness have gone away. "I have my sea legs now" and not taking any medication. They say it will be this way until we cross the Drake Passage on the way back home.

We will overnight at Palmer tomorrow and head for Deception on Sunday morning. We will arrive on Monday and begin sampling. I will be working on the MOCNESS (Multiple Opening Closing NEt Sampling System) crew the first three nights. Yes, we will be sampling starting at 23:30 and the net will fish with different net panels for 2 hours then process the catch, mostly krill. It will take until 4-5 AM to finish depending on the amount of the catch. Then we will switch to doing the same thing in the daytime beginning at 11:30. I will tell you more later about the krill and what other thing will be going on during the days after.

ANOTHER LOSS

Nearshore environmental science and marine research in southern California lost another major contributor on 7 January 2001 when Dr. Mia Tegner died in a diving accident off San Diego. Details are still sketchy, but it appears that she ran low on air, returned to the surface, then realized that she might get the bends, grabbed another tank, and returned to the bottom. She was not seen alive again.

Dr Tegner, whose research on kelp-forest ecology made her familiar to local workers and marine ecologists world-wide, was a very experienced diver. There are no easy answers to the many questions her death prompts. According to news reports her gear was not at fault and was working perfectly when retrieved. Her fellow Scripps scientist Conrad Limbaugh, an even more experienced diver, also drown while cave-diving a number of years earlier. Even experienced divers (Mia had over 4000 dives to her credit) eventually can fall prey to the risks associated with submerging, totally dependant on gear and technology, in water. Mia was fully aware of those risks and was a careful and thoughtful diver. Suffice it to say that she will be missed as a researcher, and as an acquaintance and/or friend to many SCAMIT members. By all accounts she was a delightful person. Our lives are again saddened by loss of a compatriot.

The following is reprinted with permission from the Scripps web site:

www.sio.ucsd.edu

"We knew Mia when she was a young adult just beginning her scientific endeavors. She grew to maturity with us, and spent her life at Scripps," said Dr. Charles F. Kennel, director of Scripps Institution of Oceanography. "She dedicated more than 25 years of work to the ecology of the kelp beds off Point Loma in San Diego, and she developed a new and deep appreciation for this delicate, undersea rain forest. The ocean world has lost a treasure."

An experienced scuba diver, Tegner made more than 4,000 dives throughout the world during her 31 years at Scripps. Her main scientific research focused on the ecology of kelp forest communities and nearshore marine resources. She worked extensively on sea urchin natural

history and population dynamics, the ecology and restoration of abalone populations in southern California, and the effects of disturbances and climate change on kelp communities. She studied the Point Loma kelp beds for almost three decades, and her long time series of observations has been instrumental to scientists' understanding of the effects of ocean climate on nearshore ecosystems.

Tegner's most current research included studies of the effects of El Niño and La Niña events on the plants and animals of the kelp ecosystem. One project focused on the reproductive response of abalone populations to warm water, and how to incorporate environmental variability into fisheries management.

The San Diego wastewater treatment plant discharges treated sewage near Tegner's kelp bed study area, and since 1992 she has measured the effects of the sewage on the local marine life. She found great satisfaction in using the information she gathered on the health of the Point Loma kelp forest to promote a better understanding of the effects of sewage on marine organisms. The information she gathered assisted the state of California with the maintenance of state fisheries and provided citizens with the facts they needed to make informed decisions about environmental issues such as sewage treatment.

Tegner was born in Santa Monica, Calif., on July 7, 1947. She decided on a career in science after abandoning hopes of fire fighting in the third grade. She received a B.A. degree in biology from the University of California, San Diego, in 1969, and a Ph.D. in marine biology from Scripps in 1974.

She started studying sea urchins shortly after she joined Scripps in 1969 as a marine microbiology trainee. As a post-doctoral researcher, her interests shifted from the fertilization biology to the field ecology of sea urchins. In 1983 she began studies on El Niño and its effects on kelp beds.

With colleagues Paul Dayton, Peter Edwards, and Kristin Riser, Tegner was honored with the prestigious Cooper Ecology Award in August 2000. Marking a first for research in an oceanic system, the Cooper Award honored Tegner and her research team for their investigations of the Point Loma kelp forest communities. "These four researchers at Scripps Institution of Oceanography were able to address fundamental questions about sustainability of communities in the face of disturbance along environmental gradients," the Ecological Society of America noted in announcing the 2000 award.

In 1998, Tegner was awarded a fellowship in the Pew Fellow Program in Marine Conservation to develop an ecosystem approach to fisheries management for kelp forest species that takes into account the changing environment. Other recent awards included the 1998 Conservation Award from the Sonoma County Abalone Network and the 1986 University of California, San Diego, Distinguished Alumna of the Year award.

Tegner was a fellow of the American Association for the Advancement of Science, and was a member of the American Society of Limnology and Oceanography, the International Abalone Society, National Shellfish Association, the Southern California Academy of Sciences, and the Western Society of Naturalists.

She is survived by her husband, Eric Hanauer, of San Diego, Calif., a daughter, Sandi Hanauer, of Costa Mesa, Calif., her parents Oly and Allie Tegner of Palos Verdes, Calif. and a sister, Lars Palsson, of Palos Verdes, Calif. "

In lieu of flowers, donations in Mia Tegner's memory can be made to Scripps Institution of Oceanography to support kelp forest research. For more information, contact the Development Office, Scripps Institution of Oceanography, 858/822-1865.

CALL FOR NOMINATIONS

Election time approacheth. Please submit in writing, via e-mail, by telephone, or at the next meeting, nominations for SCAMIT officers. I think we can all, by acclaim, renominate the existing roster of tireless public servants who currently occupy those positions. It is NEW nominations we are seeking. If you feel you have the interest and time to be an officer, by all means nominate yourself, or have a friend [or enemy as the case might be], relative, or coworker nominate you. No organization long survives without member participation. If you would like this one to continue, consider running for office. Let YOUR voice be heard.

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Volumes 1 - 4 (compilation).....$ 30.00
Volumes 5 - 7 (compilation).....$ 15.00
Volumes 8 - 15 ..... $ 20.00/vol.

Single back issues are also available at cost.

Differences in Species of Eualus from the Pacific Coast of North America

Ronald G. Velarde 11 December 2000

CHARACTER	SPECIES LINEATUS	PUSIOLUS	SUBTILIS
1) Antennular Spines -dorsodistal spines on first article of antennular peduncle	**3 moderate**	**1**	**1 stout**
2) Base of Stylocerite with Curved, Dorsal Tooth	**present**	**?**	**absent**
3) Suborbital Carapace Spine	**present**	**present**	**absent**
4) Meral Spines on Third Pereopod	**1 (0-2)**	**1**	**3 (2-5)**
5) Sexual Dimorphism	**no**	**no**	**yes**
6)Color Pattern	**- broad orange bands against a translucent background** Jensen & Johnson, 1999 Figure 5	**?**	**- thin red diagonal lines on carapace and 1st abd. segments** Butler, 1980 Plate 1C (as E. herdmani) Jensen, 1995 Figure #72 (as E. pusiolus)

Southern California Association of Marine Invertebrate Taxonomists

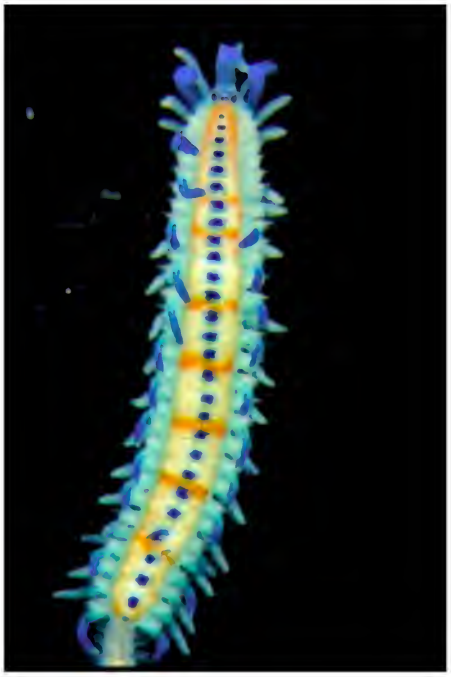
3720 Stephen White Drive
San Pedro, California 90731

January, 2001

SCAMIT Newsletter

Vol. 19, No. 9

SUBJECT:	Lumbrinerids along with a Special Presentation on Ophiuroids and ecotoxicological research
GUEST SPEAKER:	Larry Lovell & Dr. Dimitri Deheyn
DATE:	9 April 2001
TIME:	9:30 a.m. to 3:30 p. m.
LOCATION:	Scripps Instituion of Oceanography Benthic Invertebrate Collections Area



Myrianida pachycera (Augener)
Photo by Arne Nygren

The next meeting topic will be Lumbrineridae, presented and led by Larry Lovell. Larry will be presenting the results of his expert examination of the B'98 lumbrinerids. We will also be treated to a talk by Dr. Dimitri Deheyn entitled "Shedding Light on the Subject of Pollution: could bioluminescence of brittlestars be used in ecotoxicological research?" Dr. Deheyn's series of papers on brittlestar bioluminescence over the past years have often been included in the New Literature section of the Newsletter. This should be a very stimulating presentation, and will give us a chance to talk to him directly.

Come, and bring your specimens of lumbrinerids - both the occasional intact specimens, and the more typical fragmentary ones - for possible examination at the meeting. This will be a full day.
For further directions please visit the SCAMIT website.

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SCAMIT Newsletter is not deemed to be valid publication for formal taxonomic purposes.

WORKING KNOWLEDGE

Two of the largest POTW dischargers in Southern California have job opportunities for SCAMIT readers. Two biologist positions have closed at the County Sanitation Districts of Los Angeles County, with interviews very soon. The City of San Diego currently has a position for an entry level Marine Biologist listed on the SCAMIT website. The response to this offering will be establishment of a list of qualified applicants who will be considered for the current posting and any others that arise in the next year or so.

Most of us will have one or more new compatriots as a result of these position availabilities. Hopefully these fresh faces will prove to be active participants in SCAMIT.

ELECTIONS

Once again we are faced with an uncontested election. No new candidates have been proposed, or have volunteered to run in opposition to the current slate of officers. Fortunately, all of the current officers have consented to run for an additional term. They are ably serving the organization, and their willingness to continue is admirable, but they must be getting a bit tired after years (in one case decades) of service to the membership. If this trend continues we may soon be placed in the uncomfortable, and I believe unprecedented, situation of having no candidates for one or more offices should one or more of the serving officers be unable or unwilling to run again. Please consider this, and reconsider the possibility of serving as an officer during the next year. Hopefully our 2002 election will embrace more diversity of choice for the membership. Voting has always been on a par with or below levels of participation in the U.S. as a whole, and those elections are vigorously contested. How interesting can it be to vote on a pro forma basis? We need more participation, not less, and a hard fought campaign might actually provide some. Please try to overcome your ennui and return your ballots with your votes and comments, despite the nature of this election. The candidate statements and ballot are included in this newsletter.

NEW LITERATURE

Animals with complex life-cycles provide a rich breeding ground for misinterpretation and misunderstanding among those of us who must try and identify them in our daily lives. Perhaps foremost among these are the hydrozoan Cnidaria, whose alternation of generations has produced so much confusion that entire taxonomic hierarchies have been placed in competition. Bavestello et al (2000) discuss a further complication to an already difficult situation, morph reversibility. This usually involves a regressive transformation of the medusa phase into a polyp phase without going through sexual reproduction. Such changes are often produced by unusual environmental conditions. The usual result is a polyp similar to, but not identical with, the polyp which originally liberated the medusa. Research is continuing, but we should be alert to this possible complication of an already murky identification area.

For reasons unknown taxonomic subjects tend to go through research and/or publication cycles. Currently there is a cycle of unusual activity in the publication of articles on a generally under-treated area; the taxonomy of aplacophore mollusks. In this group investigations from all over the world have bearing on the California fauna because the literature as a whole is not very rich and every little bit has the potential of assisting us with our local fauna.

Garcia-Alvares, Urgorri & Salvini-Plawen (2000a) describe new species of *Dorymenia,* a genus represented in the California fauna, from the South Shetland Islands. They also (2000b) describe a new *Sputoherpia* from Spanish waters. This later genus is not represented locally, although two other genera in the Amphimeniidae, *Platymenia* and *Pachymenia*,

are represented in deeper Californian waters. Scheltema & Ivanov (2000) provide an examination of the Prochaetodermatidae from European waters. We do have a local representative in southern California, *Spathoderma californica* (Schwabl 1963), and a number of species from further north in the Eastern Pacific. In this group the gross appearance of the organisms can be used as a cue in their speciation, and one of the most informative aspects of the present paper is its fine drawings of the gestalt of whole animals. Fourteen members of the family, distributed among five genera, are treated in detail. This neatly complements and extends Scheltema's earlier treatment of the family.

In addition to description of new species, the entire basis of the taxonomy of the group is being reassessed. Scheltema & Schander (2000), for instance, reexamine character states of a variety of species in describing seven new species from various geographic areas. They emphasize characters of hard parts and body form as valuable analytic characters and provide a cladistic analysis of the considered taxa. None of these species are local, but several of the considered groups are represented locally, and the discussion of characters is quite useful.

Debate has been often joined concerning the appropriate status and relationships of the aplacophores, including the nature of the relationship between the two main types of animals combined under that term - the ventral groove bearing solenogasters, and the posterior gill bearing caudofoveaceans. There are two main "sides" in this debate; one maintaining the primitivity of the group, and the other suggesting it is advanced with its unique body derived by paedomorphosis. Haszprunar (2000) revisits and summarizes this debate and provides a new cladistic analysis. The present paper will not end the debate, but provides a useful discussion of the various lines of evidence. Those interested in further information on the group should visit the aplacophore homepage at:

http://www.whoi.edu/science/B/aplacophora/

With the recent WEMAP sampling, regional monitoring continued the trend of intrusion into shallower waters begun during B'98 sampling. It behooves us, therefore, to begin to consider the structure of estuaries in which we may soon begin, or are now sampling. Emmett et al (2000) provide a broad framework for such consideration and treat all of the estuaries on the west coast. Their paper provides a concise summary of general knowledge of estuaries along our coast and provides a bibliography of articles describing, in more detail, individual bodies of water.

JANUARY 8 MEETING MINUTES

The meeting was held at the San Diego Marine Biology Laboratory. President Ron Velarde began the business portion of the meeting. He handed the floor over to Vice-President Leslie Harris who gave us the upcoming schedule of meetings.

The next meeting is a 2-day meeting, February 12 and 13, and will be held at the Los Angeles County Museum of Natural History. We will be discussing 2 large polychaete families from the 7th volume of the MMS Atlas, the Ampharetidae and Terebellidae.

The March meeting will be held on March 19 at the San Diego Marine Biology Laboratory. Guest speaker Karen Green will attend as we discuss the capitellid chapter of Volume 7 of the MMS Atlas. Karen has done extensive work on polychaete staining patterns and we are fortunate to have her participation at this meeting.

The April meeting will be held on April 9 and is to be held at Scripps Institute of Oceanography. Our guest speaker will be Larry Lovell and he will elaborate on the lumbrinerids from the Bight'98 project.

Please inform Leslie Harris if you have visiting colleagues who are coming to town and would like to be a guest speaker at a SCAMIT meeting.

Dot Norris circulated several articles that she found in Current Contents. They were: Bhaud (2000), Olive et al (2000), Pleijel (1999), Rozbaczylo & Simonetti (2000), Jha et al (2000).

Leslie reported that the Los Angeles County Museum has recently hired 2 people, Kathy Omura and Phil Hoover. They will primarily be sorting invertebrate samples that have been deposited at the museum.

Ron Velarde then notified us about a couple of meetings. The Southern California United Malacologists met on Saturday, January 20 in the Times-Mirror Room at the Los Angeles County Museum. George Davis from the crustacean department and Lindsey Groves from the mollusc department were co-organizers of the meeting.

The Southern California Academy of Sciences meeting will be held in May 2001. Stay tuned for more details in upcoming newsletters.

Next, Leslie introduced our guest speaker, PhD student Arne Nygren from the University of Göteberg,Sweden. Arne's dissertation will be on the polychaete subfamily Autolytinae. In his presentation, Arne described the different reproductive strategies of autolytines, gave tips on identifying autolytines, and presented his research.

In the Autolytinae there are approximately 140 described species in 5 genera. He described the different types of reproductive strategies including epigamy and schizogamy. There are different types of schizogamy; scissiparity in which 1 stolon is produced at a time and gemmiparity in which many stolons bud off from the posterior of the adult. For example, epigamy is found in *Autolytus noroi* and *A. magnus*. Anterior scissiparity is found in *Proceraea* spp, *Procerastea* spp and *Virchowa* spp. Posterior scissiparity is found in *Autolytus inermis*. Gemmiparity is found in *Autolytus* spp and *Myrianida* spp.

Arne gave us some general advice to use when examining autolytines. He said that it is best to view live material when possible. He discussed the various morphological groups of autolytines and listed which characters are most useful in identifying and separating the groups. The number of teeth and rings in the trepan is the most important structure. Arne found that squeezing the anterior end of the specimen on a slide and mounting with permount works well to view the trepan. Other useful characters include the number of muscular bands in the proventricle, length of cirrophores and length of nuchal organs.

Arne then showed us slides of autolytines that he had identified from the Southern California area. Among the species were *Autolytus pentadentatus* Imajima, *A. convolutus* Cognetti, *A. inermis* Saint-Joseph, *A. noroi* (Imajima & Hartman), *Myrianida pachycera* (Augener), *Proceraea nigropunctata* Nygren and Gidholm, *P. okadai* (Imajima), *P. kiiensis* (Imajima), *P. cornuta* (Agassiz), *P. gigantea* Nygren and Gidholm and *Procerastea* sp.

In Arne's research he investigated 3 questions: 1) Is schizogamy or epigamy the primitive mode within Autolytinae?, 2) Which type of schizogamy is the most plesiomorphic?, and 3) Are the five genera monophyletic groups? In his analysis Arne used morphological and molecular characters to construct a phylogenetic tree. The conclusions he drew from the phylogenetic tree were: 1) schizogamy is the primitive reproductive

condition, 2) the tree was inconclusive so the second question remains unanswered at this time, and 3) *Autolytus* is a non-monophyletic group.

Arne would be glad to receive any live material. Most autolytines live in intertidal, subtidal, hard bottom habitats and consequently, most described species come from these habitats. In Southern California we probably encounter undescribed species, since the samples from our monitoring programs are collected from mainly soft bottom habitats.

Next was Ron Velarde's presentation on his work with autolytines at Long Beach State University. The topics he covered were: 1) major characteristics of the subfamily Autolytinae, 2) major characteristics of the genera, 3) Autolytinae previously reported from California, 4) material and methods, and 5) new records of Autolytinae from Alamitos Bay.

Ron showed major characteristics on the general body form. Most California species have not been looked at closely, especially the trepan. There was a discussion about the use of clearing solutions in order to better view the trepan. Oil of wintergreen has been tried but there has been limitations. Although it clears the animal, the tissue becomes very brittle making it difficult to save the specimen.

Ron distinguished between thick and thin types of bayonet setae as follows: thick bayonet setae were more than1/2the width of the compound setae, and thin bayonet setae were less than 1/2 the width of the compound setae.

There was a generalized life cycle chart with reproductive stolons formed by budding from the adult, then they developed swimming setae, and stolons swarmed at the surface. This uncommon life cycle has led to significant problems in the taxonomic literature. Some species have had 3 separate descriptions; one for the female stolon, one for the male stolon, and one for the adult.

Ron presented a summary of species that were known from California including records, reported taxon, author, locality, and revised taxon. He described how he and some colleagues collected live material from docks in Alamitos Bay. Using night lights for illumination, they collected swimming stolons with nets and took them back to the lab where Ron kept the stolons and observed the growth of the juveniles. Meeting participants enjoyed taking a trip to the past, and some identified themselves in Ron's slides from ca. 20 years ago!

Next we turned our attention to some of the smaller polychaete families from the MMS Atlas, Volume 7. First up was Chapter 3, the Fauveliopsidae (Blake & Petersen 2000). This was an excellent chapter and included details of morphology and taxonomic history. We discussed *Fauveliopsis* sp SD 1 and how it differs from *F. glabra*. *Fauveliopsis* sp SD 1 has 1 spine and 1 capillary seta in each posterior ramus, and *F. glabra* has 2-3 spines and 2-3 capillary setae in each posterior ramus.

In *Fauveliopsis* sp SD 1, the interramal cirri are ovate, and in setigers 1 and 2, they are in a medial position. In F. *glabra*, the interramal cirri are stalked, and in setigers 1 and 2, they are close to the notosetae.

The SCAMIT record of *F. armata* collected from Orange County, 300m is questionable and should be checked using the new chapter and the information provided here.

The next chapter we discussed was Chapter 11, Family Sternaspidae (Petersen 2000). The chapter contains extensive details on this small but interesting group and it includes a table (11.1) of validly described species. We discussed *Sternaspis* cf. *fossor* and decided to continue to use *Sternaspis fossor* for our specimens that we collect in Southern California. SCAMIT does not retain the "cf" designation, but recognizes the difficulties with the identity of this "cosmopolitan" species

presented in this chapter by Mary Petersen. The other species described was *S. maior* which lives in deep habitats and has not been recorded by SCAMIT members.

The next chapter we discussed was Chapter 2, Family Acrocirridae (Blake 2000b). Ron noted two updates to the SCAMIT species list; *Acrocirrus frontifilis* Banse 1969 and *Macrochaeta* sp A fide Rowe 1999 will be added in the next edition. There was discussion of the provisional species, *Macrochaeta* sp A (formerly *Acrocirrus* sp SD 1), described by Rick Rowe from the City of San Diego's International Treatment Plant stations and Bight'98 stations. It occurred at depths ranging from 33m to 171m. *Acrocirrus heterochaetus* Annenkova 1934, the species described in this chapter, has not been reported by SCAMIT. When identifying acrocirrids, we agreed to use Banse 1969 to supplement this chapter.

The next chapter up for discussion was Chapter 6, Family Scalibregmatidae (Blake 2000e). SCAMIT reports only *Scalibregma inflatum*. We discussed the description of *S. californicum* in the Atlas and agreed to examine more of our specimens of *S. inflatum* and see how they compare. Rick Rowe has examined one specimen and found 3 blunt setae with grooves in addition to the 5 pointed setae shown in Figure 6.1.G for *S. californicum*.

We discussed the record of *Asclerocheilus californicus* which is reported in the SCAMIT species list. Tom Parker had found these specimens at a station with coarse sediment at a depth of 300m. After reviewing some characters of the specimens, we decided to back off to "sp" on the identification.

There was reason to celebrate during our lunch break; it was Dot Norris's birthday! Dot also had a treat for us; a video tape with spectacular footage she shot while swimming with a whale shark and manta rays. Both of these dive trips took place during Dot's trip in November to the Kona coast of Hawaii.

The next chapter discussed was Chapter 7, Opheliidae (Blake 2000f). Two of our local provisional species should be added to the key, *Ophelina* sp SD 1 fide Rowe 1995 and *Armandia* sp SD 1 fide Rowe, 1999. A voucher sheet for *Ophelina* sp SD 1 has been distributed to SCAMIT members. This species is very similar to *O. breviata* (Ehlers 1913). A voucher sheet for *Armandia* sp SD 1 will be produced following a comparison to the nearly identical *Armandia agilis* (Andrews 1891) reported from North Carolina, Bahamas, and the Gulf of Mexico (see Uebelacker and Johnson, 1984, Vol. III pp. 17-11 and 17-18). Following, are the suggested additions to the Chapter 7, Opheliidae key on page 149 which include the local provisionals.

4A. Branchiae present, 27 pairs; setal lobes small; short anal funnel with 8 short cirri and a long unpaired cirrus.....*Armandia brevis*

4A'. Branchiae present, 37 pairs; setal lobes long anteriorly, decreasing in size becoming small by the 14th setiger; long, tubular anal funnel with 14 short, terminal cirri and a long unpaired, ventral and subterminally inserted cirrus.....*Armandia* sp SD 1

5A'. Body moderate to small; branchiae present; anal funnel a long, cylindrical tube with eight short and two ventral, longer (3x) cirri.....*Ophelina* sp SD 1

Rick Rowe has reported a specimen with the pectinate branchiae of *Euzonus dillonensis* (Hartman 1938) from an International Treatment Plant station (ITP I-6, 24 Jan.2000, 85ft. depth) near the U.S.-Mexico border. And it was commented that although *Travisia granulata* Moore 1923 was found in the list of species for this chapter, it was not included in the key or within any of the diagnoses.

The final chapter under discussion for the day was Chapter 1, Flabelligeridae (Blake 2000a). In this chapter, the synonymy of *Brada pluribranchiata* with *B. villosa* proposed by

Pettibone 1954 was followed. SCAMIT, however, does not accept this synonymy and will continue the current usage of both species names. Similarly, SCAMIT does not agree with the synonymy of *Flabelligera infundibularis* with *F. affinis* proposed by Pettibone 1954. A question arose regarding Figure 1.2.c on page 9. This illustration of a notoseta from *F. affinis* was taken from Uschakov 1955; however, these specimens were not listed among the ones examined. SCAMIT feels this synonymy needs justification and will continue to use *F. infundibulum*.

While the generic diagnosis for *Diplocirrus* is included in this chapter, no species were included. Blake does mention that he identified several species from deep-water samples taken off northern California, but none were encountered as part of this study. SCAMIT lists *Diplocirrus* sp SD 1 fide Rick Rowe 1998 which commonly occurs in San Diego Bay (and possibly other bays in Southern California).

The description of *Piromis hospitis* was examined carefully and it was determined that Blake's *P. hospitis* is actually *Piromis* sp A Harris 1985. *Piromis hospitis* Fauchald 1972 is valid and Leslie Harris has examined the holotype and found differences with *P.* sp A. Both have paired dorsal papillae; hence the first sentence under the remarks section on page 13 is incorrect. *Piromis* sp A has broad papillae and *P. hospitis* has narrow papillae. There is also a difference in where the bifid neurosetae start; they start on setiger 2-4 in *P.* sp A and setiger 7-30 in *P. hospitis*. SCAMIT will continue to use *P.* sp A. There will be a notation in the next SCAMIT species list following *P. hospitis*, "not *P. hospitis* of Blake 2000".

The description of *Pherusa capulata* (Moore, 1909) was questioned because the single specimen examined and illustrated was a juvenile (6mm long). When identifying specimens of *Pherusa* and *Piromis*, refer to Leslie Harris's handout which illustrates some distinguishing characters of both genera. In Hartman 1969, there is an error with a figure accompanying the description of *Pherusa capulata*. Figure 2 is actually an illustration of a *Piromis* sp A neuroseta .

It appears that *Pherusa neopapillata* and *P. papillata* are reversed. For example, Figure 1.7.B (an original figure) is what we would call *P. papillata* Hartman 1961. Leslie has looked at many specimens of both of these species and she concluded that the local species we commonly encounter in soft sediments is *P. neopapillata*. Therefore, a change should be made to the key on page 4. Couplet 8A refers to *Pherusa papillata* and 8B refers to *P. neopapillata*. Additional changes suggested for the Flabelligeridae key on pages 3 and 4 include the following:

2B'. Neurosetae from segments posterior to cephalic cage include unidentate, curved, and hooded falcigers.....*Pherusa negligens*

3A .....change *Piromis hospitis* to 9

9A. With large triangular dorsal pair of papillae on each segment anteriorly.....*Piromis* sp A

9B. With narrow, cirriform or digitate papillae on each segment anteriorly.....*Piromis hospitis*

Consideration of the remaining chapters of Volume 7 will continue at future meetings.

My Life as a Biologist
by Donald J. Reish
Chapter 20: The Worm Farm

How did the worm farm come about? Like so many things, some incidental events led to the establishment of the worm farm. As I had discussed in earlier chapters, I established the culture of *Neanthes* in1964. My students and I used the worms for a variety of experiments. In 1975 I was invited to present a paper at ASTM (pre-E-47 times) sponsored symposium at Virginia Polytechnic University in

Blacksburg. I presented a talk on the culture techniques with polychaetes and discussed their potential as toxicological test animals. After my presentation two men talked with me about the possibility of shipping worms to them. One was Jim Horne (I see him every year at SETAC) and one from the US Navy. They both purchased worms from me-adult size-and thus the worm farm began. I also sold *Capitella* and collected *Dexiospira* for settlement studies which resulted in 2 papers with people from Harvard.

As I left Blacksburg, I noticed a sign giving directions to Christiansburg, 3 miles. I had spent a week-end there in 1942 with my Dad and we stayed at his brother's home. On my next visit to Blacksburg for a work-shop, I met my cousin. Another cousin had gone to Virginia Polytech. After completing his PhD, Mike Johns did a post-doc at the EPA lab in Rhode Island. He worked with Carol Pesch. She had spent 3 weeks in my lab learning how to culture *Neanthes*. She had established a culture in Rhode Island and Mike had helped her. Mike then took a position with a consulting firm in Seattle. An area in Puget Sound was declared a superfund site and Mike, together with Tom Ginn and others developed the 20 day juvenile growth test for studying effects of contaminated sediment. I was involved in some of the planning and development of this test. The test became standard and was picked up by other agencies and many consulting firms. At the present time cultures of this species are maintained by the Army Corps in Mississippi, Hong Kong, Korea, and the United Kingdom.

Why use this animal? It lives in sediment, the worms are isogenetic, readily available, and have excellent control survival. While it is not the most sensitive test animal, the use of growth as a measure is a good sublethal test. How many labs have used this animal? Presently about 80 firms. At last count the total sold over the past 25 years is nearly 400,000. This figure does not include those used by my students and me nor the tests I conducted at Orange Co. Sanitation District. I have prepared a bibliography of the published papers, abstracts and some reports-it totals about 200 citations. This figure does not include the reports issued by consulting firms since I do not have access to them.

Jim Weinberg and his wife followed up on earlier studies by Gerald Pesch and found that the Connecticut Population (known as *N. acuminata*) has a chromosome number of 2N=22; my lab culture has 2N=18; the local natural populations has 2N=18 but the centromere is located at a different spot in one chromosome pair. A Hawaiian population has 2N=28. The Southern California population should not be referred to as *N. acuminata* (as indicated in the SCAMIT species list). It is a new species! No one has looked at the chromosome number of *N. caudata* (the European species which is the same general type as the others). I also found it at Eniwetok Atoll, Marshall Islands. How many similar species problems like this occur in polychaetes? I think it is widespread as shown with the *Capitella* complex.

What do I do with the money from the sale of worm? Many things. It has paid salaries to many students (still does) and my son Jim, I started taking salary after I reached the age of 70. It has paid my way to scientific meetings, helped with publication costs for the polychaete proceedings, helped pay travel expenses for students going to meetings, helped pay for sea water, and even purchased air conditioning units for biology department offices.

What has the worm meant to me? I think that it has helped to emphasize the importance of polychaetes in marine environmental studies. I think that I have been one of the principal players, if not the principal one, in championing the cause of the importance of polychaetes in marine pollution studies (50 years). This worm has provided me the

opportunity to attend meetings and given me a forum to stress the importance of polychaetes. Polychaetes have played an important role in my scientific life and *Neanthes* has been at the forefront.

Next: Retirement years

[Editor's Note - with this installment we return to the final chapters of Dr. Reish's memoirs. He still continues with an interesting and busy life however, and hopefully more chapters remain to be written. The next two Newsletters will be graced with Chapters 21 and 22. Stay tuned.]

OUT IN THE COLD

(Larry Lovell has safely returned from the Antarctic, but we will continue to print his correspondence from that journey)

Hi family and friends,
Yes it is day two of MOCHNESS. The fish (as we call it) is in the water and sampling for krill. Last night was the first night of MOCHNESS. The weather was very nice with little wind. The catch was good and not overwhelming, but it did take until 11:00 am to finish processing the three samples collected. That was with 7 of us doing it. There were four species of krill (*Euphausa superba* being the dominant), a few amphipods, some ctenophores, a few juvenile fish, and a few larval fish. The *E. superba* had green stomachs from all the phytoplankton they had been eating. There were literally thousands of krill and the other organisms separated into jars for counting and weighing. They are then placed in an optical plankton counter that works like this. The krill are put into the top of the counter, they are suspended in seawater and run past a beam of light. Every time the beam of light is interrupted the machine makes a count of one. For the number collected, this is the most efficient way to count the extremely large numbers. I now know why whales, penguins, seals, and other sea birds love krill. They are about the size of a small shrimp and very abundant in these cold productive waters. Four of us ate some raw last night. It was salty, a little crunchy, and tasted like Ebi sushi (raw shrimp). I finally got to bed at noon.
Will probably have the same routine tonight, but I may be up later since there will be two grab samples coming aboard tomorrow morning some time that I am in charge of processing (sieving, relaxing, and preserving). It should go smoothly. This is something I have done before many times.
The sun set at 2:30 am last night and rose at 3:30. It was a really beautiful sunrise with no clouds.
Hope you all have a happy Turkey Day. I will be working the night shift one more time then switching back to days on Friday.
Regards from Sea,
Larry

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CANDIDATE BIOGRAPHIES

PRESIDENT

Ron Velarde

Ron is the current President of SCAMIT and a past Vice-President; he has been a Marine Biologist with the City of San Diego since 1983 and currently is the supervisor of Benthic Taxonomy for the Ocean Monitoring Program. His taxonomic interests include most groups, especially polychaetes and nudibranch mollusks. He earned his B.S. degree in Marine Biology from California State University, Long Beach, in 1976, and did post-graduate research on the systematics and ecology of autolytid polychaetes.

VICE-PRESIDENT

Leslie Harris

Collections manager of the Allan Hancock Foundation Polychaete Collection, at the Los Angeles County Museum of Natural History. Ongoing research centers on taxonomy of the polychaete fauna of pacific North America, polychaete-algal associations (especially in *Macrocystis*), introduced species, and Caribbean reef polychaetes.

SECRETARY

Megan Lilly

Graduated from Humboldt State University in 1991 with a B.S. in Marine Biology. From 1991 to 1993, worked at the Santa Barbara Museum of Natural History where the taxonomy of marine mollusks was studied under Dr. Eric Hochberg, Paul Scott, and Hank Chaney. Currently working as a marine biologist for the City of San Diego's Ocean Monitoring Program. Specialities include echinoderms, miscellaneous phyla and mollusks, with an emphasis on cephalopods.

TREASURER

Ann Dalkey

Ann is presently the Treasurer for SCAMIT and has held this position since SCAMIT was founded. Ann is a member of the water biology staff at the Hyperion Treatment Plant where she specializes in the identification of polychaetes and amphipod crustaceans. Prior to working at Hyperion, Ann was a member of the laboratory staff at the County Sanitation Districts of Orange County. She worked there for nearly 10 years, reaching a position of senior laboratory and research analyst. She received her B.S. from California State University Long Beach in Marine Biology in 1974 and her M.S. from the same university in 1982. Her thesis research pertained to polychaete bioassay.

SCAMIT would like, at this time, to extend its heartfelt thanks to Ann Dalkey for serving unerringly and graciously as its treasurer for the last 20 years. This year will be Ann's last as she has expressed her desire to retire (well earned) from the position next year. We look forward to our last year with her and hope some one will start considering filling this position in the future.

BALLOT FOR SCAMIT OFFICERS 2001-2002

Vote for one (1) nominee for each office. Please mail or return completed ballot to Leslie Harris by May 31, 2001. You may return it to the Secretary or other attending officers at the April or May meeting. The address to mail it to is:

Leslie Harris
Worm Lab
Los Angeles County Museum of Natural History
900 Exposition Blvd.
Los Angeles, CA 90007

President - The president presides at all meetings and represents SCAMIT in external business affairs.

____ Ron Velarde

____Write in: _____

Vice-President - The Vice-President chairs ad hoc committees, supervises the specimen exchange, tabulates election ballots, and fills in for the President as necessary.

____ Leslie Harris

____ Write in: _____

Secretary - The Secretary keeps minutes of the meetings, is responsible for the newsletter, and preparation of the ballots.

____ Megan Lilly

____ Write in: _____

Treasurer - The Treasurer collects dues, makes disbursements, keeps financial records, and makes an annual statement of the financial status of SCAMIT.

____ Ann Dalkey

____ Write in: _____

2001-2002 SCAMIT Meeting Topics - Please suggest any topics you deem worthy of a SCAMIT meeting.

_____

Please visit the SCAMIT Website at: http://www.scamit.org

SCAMIT OFFICERS:

If you need any other information concerning SCAMIT please feel free to contact any of the officers e-mail address

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Back issues of the newsletter are available. Prices are as follows:

Volumes 1 - 4 (compilation).....$ 30.00
Volumes 5 - 7 (compilation).....$ 15.00
Volumes 8 - 15 ..... $ 20.00/vol.

Single back issues are also available at cost.

Southern California Association of
Marine Invertebrate Taxonomists

3720 Stephen White Drive
San Pedro, California 90731

February, 2001

SCAMIT Newsletter

Vol. 19, No. 10

SUBJECT:	Review of the Bivalve Book
GUEST SPEAKER:	Paul Valentich Scott and Gene Coan
DATE:	14 May 2001
TIME:	9:30 a.m. to 3:30 p. m.
LOCATION:	Invertebrate Collections Santa Barbara Museum of Natural History

Figure 1 - *Thelepus hamatus*
I28(1),11JUL00,185 ft.
Image by K Barwick 15NOV00

Next Meeting: Review of the "Bivalve Book" with authors Gene Coan and Paul Valentich Scott (2 out of 3 ain't bad). Pull together your questions, annotations, range extensions [and verifying specimens], comments, corrections, and still unresolved bivalve taxonomy difficulties and bring them to the meeting. How: Contact Secretary Megan Lilly if you need directions on how to find the meeting location.

SCAMIT Ed. 4

Originally scheduled for completion last June, Ed. 4 is stretching on into its third year of expectation. We have delayed releasing it for a number of events, including the Bivalve book mentioned above, the completion of the B'98 sampling, and now the discussions of the taxonomic changes proposed in the final volume of the Taxonomic Atlas series from the Santa Barbara Museum of Natural History. We

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SCAMIT Newsletter is not deemed to be valid publication for formal taxonomic purposes.

had hoped to be done by this time, but there are still several chapters of the last Atlas volume (the final installment of the multi volume treatment of the annelids) to be reviewed.

NEW LITERATURE

Welcome to your "all phylogeny - all the time" new literature section. The virtual cascade of examinations, reexaminations, retrenchments, methodological tweaks - and resultant analytic modifications - of invertebrate relationships which have stemmed from the exponentially increasing availability of molecular taxonomic data continues. While we are still far from completion of alpha description of the marine invertebrate biota, apparently a critical mass of information has been reached.

Using 18S rDNA sequences Harasewych & McArthur (2000) examine the relationship of patellogastropods to most other groups of gastropods. An attempt was also made to elucidate relationships within the patellogastropod clade itself. The patellogastropods proved to be a very well supported clade congruent with the orthogastropod/eogastropod split argued by Ponder and Lindberg. Present data is not, however, sufficient to determine with confidence the primitivity of the various groups, so whether patellogastropods are a basal group or not remains in question. The18S rDNA gene proved ill suited for resolution of relationships within the group, and the authors suggest that investigation based on mitochondrial genes may prove more informative.

While the patellogastropods are widely assumed to be a basal clade, the nudibranchs have always been viewed as advanced. Wagele & Willan (2000) provide a phylogeny of this clade based on morphological, anatomical and biological characters. In preparation for their analysis they provide an interesting and useful conceptual history of the interpretation of the group and its relationships within the Mollusca. Their analysis confirmed the monophyly of several groups including the Anthobranchia and the Cladohepatica, while demonstrating convincingly that the Arminoidea was an artificial paraphyletic grouping of disparate clades. It would be instructive to view this again based on genetic data. It is probably that the neat separations seen with morphological data may be somewhat modified on the basis of genetic evidence.

The allied group of Pulmonata was examined using ribosomal gene data by Wade and Mordan (2000). Although both nudibranchs and prosobranchs were included as outgroups in the analysis, both were represented by too few taxa for evaluation of their internal relationships. Both did separate well from the pulmonates, with the opisthobranchs [nudibranchs+anaspideans] and pulmonates joining in a euthyneuran clade. Use of rRNA genes seemed to be a fruitful tool in evaluation of pulmonate phylogeny.

Ribosomal data (this time 28S rDNA) was also used by Colgan, Ponder & Eggler (1999) to examine the phylogeny of the gastropods. As part of their approach they evaluated the variability, on a clade specific basis, within various regions of the examined gene. They also compared their DNA results with results of analysis based on histone H3 sequences. They found wide variations in evolutionary rate within different portions of the gene, and that such variations were fairly clade specific. They found the Eogastropoda/Orthogastropoda split mentioned above is not supported by data from the analysed gene. Patellogastropod monophyly was indicated, as was monophyly in Euthyneura and "higher" vetigastropods, while polyphyly was evident in the Cocculiniformia. Potential problems in the morphologically based concepts of Caenogastropoda and Heterobranchia were indicated by relatively low support in the present analysis. As more analytic data of all types is accumulated we are (hopefully)

spiraling in on a unified view of gastropod relationships. Currently not even the latest analytic results are definitive. Work continues along many lines of evidence.

The equally contentious area of annelid phylogeny has been revisited by McHugh to respond to previous critical commentary (1999), and to provide a review of the current situation (2000). The introductory sentence to the latter paper is particularly illuminating, "The most striking thing about the phylogeny of the Annelida is how poorly resolved are the evolutionary relationships of this large, ancient, and ecologically important metazoan group." 'Nuf said here. If the subject compels you, don't miss these two papers, and tune in to the Annelida website for a more extensive and authoritative discussion of the issue.

Added taxonomic sampling, inclusion of fossil taxa, and advantageous out-group usage have allowed Ahyong & Harling (2000) to produce a very admirable phylogeny of the stomatopods. Their analysis suggests seven distinct superfamilies, increasing the previous accepted total of five by removal of two new superfamilies from a paraphyletic Gonodactyloidea. Now this morphologically based phylogenetic hypothesis should be tested independently by genetic data.

I snuck in one phenetic analysis hidden in the phylogenetic paper cluster, that of the crab family Cancridae by Schweitzer & Feldmann (2000). The authors include new data on fossil taxa, and provide a new key to the genera of the family.

We return to phylogeny with Hrincevich, Rocha-Olivares & Foltz (2000) to examine a much different taxonomic level; the subgenus *Hexasterias* of the sea-star genus *Leptasterias* based on molecular data. It is one of the strengths of the method that much the same analytic techniques can be applied to such widely varying taxonomic constructs as phylum and subspecies.

It is worth noting here that Dr. Greg Deets of CLAEMD has recommended Basics of Cladistic Analysis by Diana Lipscomb as a particularly lucid methodological discussion. It can be viewed or downloaded at

http://www.gwu.edu/~clade/faculty/lipscomb/Cladistics.pdf

12 - 13 FEBRUARY WORKSHOP

The first day of the two day workshop at the Los Angeles County Museum of Natural History Worm Lab began with a brief business meeting. President Ron Velarde opened the business portion of the meeting and turned the floor over to Vice-President Leslie Harris who introduced LACM's new curatorial assistant, Kathy Omura. Leslie next passed around the Proceedings of the 6th International Polychaete Conference in the Bulletin of Marine Science, Volume 67 No. 1, July 2000.

We then turned our attention to the polychaetes of Volume 7 of the MMS Atlas. We returned to the topic of Scalibregmatidae which we discussed at the last meeting. We record *Scalibregma inflatum* and some members have re-examined their specimens. After some discussion, SCAMIT decided to adopt the new name, *S. californicum* Blake. Tom Parker has reported *Asclerocheilus californicus* from a deep station with coarse, gravel sediment.

The rest of the day was spent reviewing the large and diverse polychaete family Ampharetidae. Some corrections to the ampharetid key starting on page 174 were made. In couplet 4A, the figure referenced should be 8.14.E instead of 8.13.E. In couplet 3A, the figure referenced should be 8.15.B instead of 8.14.B.

The question was raised as to whether anyone had seen any of the new species described in this chapter. The answer was no, partially because they occur at greater depths than most of our monitoring stations.

Next we reviewed the species of ampharetids, one by one. *Amage anops*: Kelvin Barwick noted that the illustration in Figure 8.2.A was missing one thoracic setiger. We could not determine if the first notopodia was not illustrated or if it was obscured by branchiae. The first notopodial lobe is missing from Figure 8.2.B. Readers should note that the description of *A. anops* lists 14 abdominal setigers, but the illustration shows only 11. We also found the methyl green staining pattern to be somewhat vague.

Ampharete acutifrons: A correction was made on page 180, the first line of the description. Replace "13 abdominal segments" with "12 abdominal uncinigerous segments". There was a discrepancy regarding the number of abdominal setigers. The description and illustration show 13; however, we have found that *A. acutifrons* has 12 as Hartman 1969 and Holthe 1986 indicate. This is an important difference because this character is used to separate *A. acutifrons* and *A. arctica*. The pygidium of *A. acutifrons* is described (Holthe 1986) with 2 long laterals plus several cirri which is different than the pygidium shown in Figure 8.3.G. We also noticed that Figure 8.3.A lacked the long cirri which are shown in Figure 8.3.G (after Zottoli, ms). Leslie has found a different methyl green staining pattern on our local specimens. We concluded that the animal described by Hilbig does not appear to be *A. acutifrons* seen in Southern California or Scandinavia as described by Holthe 1986 but appears to be an undescribed species.

Ampharete finmarchica: A correction in the first line of the description on page 182 was made. Replace "14 thoracic setigers" with "15 thoracic setigers". *A. arctica* was synonymized with *A. finmarchica*, and this will be reflected in the 4th edition of the SCAMIT species list.

Ampharete labrops: The only comment made was concerning the narrow depth distribution (54 to 65m). Many of us have frequently recorded *A. labrops* from shallower habitats.

Amphicteis mucronata: There is a discrepancy in the number of abdominal uncinigers; the text (page 186) says 15, and the illustration (Figure 8.6.A) shows 16. Also, the thoracic setiger count does not follow the convention stated in the beginning of the chapter. According to the convention, the paleae should be included in the count, changing the total to 18 thoracic setigers (not 17) in the description. We discussed the difference in stain patterns and morphology of the lower lip of *A. mucronata* and *A. scaphobranchiata* from the Remarks section. Rick Rowe offered to stain and compare some specimens of both species and report back to us.

A. scaphobranchiata: There was some historical confusion with regard to the number of abdominal setigers in this species. Moore (1906) recorded 13 in error; later Hartman (1969) repeated the error and also recorded 13. However, the correct number of abdominal setigers is 15 (from Leslie's notes of the type specimen) and is listed correctly in this chapter. Following Hilbig's convention to include paleae in the thoracic setiger count, the description on page 188 was modified to read "18 thoracic setigers" instead of "17 thoracic setigers".

Amphisamytha: There was a discussion about the designation of the type species *Samytha bioculata*. SCAMIT thought the correct type species was *Amphisamytha japonica* Hessle 1917.

Amphisamytha bioculata: The topic of discussion for this species was branchial configuration and how it can vary with preservation. We decided to follow Williams' (1987), placing this species in *Mooresamytha* based on arrangement of branchiae.

Anobothrus gracilis: We compared *A. gracilis* with *A. bimaculatus* which we may be getting in southern California since *A. gracilis* is a European species. *A. gracilis* has 16 thoracic setigers, and *A. bimaculatus* has 15 thoracic setigers. The original description of *A.*

bimaculatus Fauchald 1972 has some errors and needs to be re-examined and redescribed. For now, SCAMIT will continue to use *A. gracilis*.

Anobothrus paleatus: This species occurs in deeper water and SCAMIT members have not recorded it.

Asabellides californica and *A. cornuta*: These two species have not been recorded by SCAMIT members but we should keep our eyes open for them.

Asabellides lineata: Rick Rowe passed around some very interesting digital images of *A. lineata*. There was a series of teeth that can be easily viewed under the compound scope by mounting the specimen (small specimens work best) ventrum up. Rick has not seen these teeth in any other species of Ampharetidae. Leslie Harris found two more examples of teeth in the Ampharetidae: 1) Ampharetidae sp B in Uebelacker and Johnson (1984), Volume 7, page 51-27 and 2) in Desbruyeres (1978).

Eclysippe trilobata: In the description on page 202, the number of thoracic setigers should be changed from 15 to 16 in keeping with the protocol for this chapter. We noted several differences between the illustrations in Figure 8.14., and Southern California specimens attributed to *E. trilobata* by SCAMIT members. For example, our specimens do not have the constriction across the ventrum shown in Figure 8.14.C nor do they have the 3 lobes on the ventral prostomium. Another difference, shown in Figure 8.14.A, is the lack of expansion in segments from about 11-14. Posterior notopodia of *E. trilobata* should be tri-lobed; in Figure 8.14.F they appear bi-lobed. Due to these differences, we wondered if this specimen is different from what we call *E. trilobata*. In addition, we have recorded *E. trilobata* from shallower habitats than the 400 - 691m range reported in this chapter.

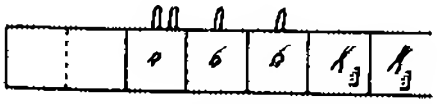
Glyphanostomum pallescens: Tom Parker recorded this in deeper water. This species usually occurs outside of our range.

Lysippe labiata: The description in the Atlas is quite general, and we decided to continue to use *Lysippe* sp A and *Lysippe* sp B. In the SCAMIT species list, due to apparent mixed lots of *L.* sp A and *L.* sp B being examined by Hilbig for *L. labiata*, Hilbig's specimen will be listed under both *L.* sp A and *L.* sp B.

Mexamage corrugata: Leslie has examined the type specimens of *M. corrugata* and *M. longibrachiata* and 32 additional species; she concluded they are the same species (unpublished data). Both *M. corrugata* and *M. longibranchiata* have 14 thoracic setigers.

Leslie cleared up some confusion we had concerning Figure 8.17.A and 8.17.B. After Leslie's examination of specimens, she found 15 podous thoracic segments. The first segment is asetigerous. The next 2 setigerous segments are often difficult to discern because the setae are broken off. The corrections to Figure 8.17.A and 8.17.B are to add setae to the second thoracic parapods. Corrections to the

Figure 2 - *Mexamage* spp



description at the top of page 208 are: change "14 podous thoracic segments" to "15 podous thoracic segments" and change "11 uncinigerous" to "12 uncinigerous".

There was a problem with the branchial arrangement as illustrated in Figure 8.17.A; the branchial arrangement should be 2/1/1. We modified the schematic of *Mexamage* in Figure 8.1. Kelvin Barwick has graciously volunteered to include the updated schematic in this newsletter; see Figure 2.

Mugga wahrbergi: The number of uncinigerous thoracic setigers in the description on page 210 should be changed from "6 uncinigerous" to "9 uncinigerous". The illustration is correct and shows 9 uncinigerous thoracic setigers. Leslie has seen specimens of *M. wahrbergi* from 2600m which is the same depth at which the holotype was collected.

Paralysippe annectens: The only comment for this species was that it is a deep water species, and Leslie thinks shallow water reports from southern California may be erroneous.

Paramage scutata: In the literature there has been some confusion about the number of abdominal segments in this species. There have been reports of 10 and 11 abdominal segments; apparently this character is variable. The description on page 214 should be changed from "11-14 abdominal segments" to "10-11 abdominal segments". Additionally, modify "17 thoracic segments with parapodia" to "14 thoracic segments with parapodia".

Pseudampharete mexicana: This species is very similar to Ampharetidae sp 1 (=Ampharetidae sp SD 1). Both have 12 uncinigerous thoracic segments and golden to brown pigment in the posterior region of the prostomium. Differences include a less pronounced lower lip crenulation in *A.* sp 1 and recording them from shallower depths than cited for *P. mexicana*. At this time, SCAMIT suspects that there are 2 separate species. This species was further discussed on the following day (see below).

Samytha californiensis: No comments.

Sosane occidentalis: The only comment made about this species is that although the paleae are described in the text, they are missing in the illustration.

Sosanopsis wireni: We compared this description with the description of *Sosanopsis* sp A (indicated in synonymy as Ampharetidae gen. B sp. A of Lissner et al 1986). We noted some differences such as *S. wireni* has 11 abdominal segments and *S.* sp A has 12 abdominal segments. SCAMIT will maintain *S.* sp A as our local identification.

Melinna heterodonta: The first comment made was the discrepancy between the schematic for *Melinna heterodonta*, page 171, Figure 8.1., and the illustration on page 224, Figure 8.25. Leslie noted that the illustration is correct, and the schematic is missing the notosetae pair on block 5. See Figure 3 for the corrected version of the schematic. In the first line of the description on page 223, change "18 thoracic segments" to "18 thoracic setigers". Secondly, on the same line, change "15 setigerous" to "16 thoracic notosetae with 14 uncinigers".

Figure 3 - *Melinna heterodonta*

Melinna oculata: In the first line of the description on page 225, change "18 thoracic segments, 16 setigerous" to "18 thoracic setigers with 14 uncinigers". We discovered differences in the number of teeth in the postbranchial membrane between the key on page 175, the descriptions, and the illustrations for both *M. heterodonta* and *M. oculata*. In the key on page 175, couplet 6A reads "postbranchial membrane with 13 or 14 teeth" for *M. heterodonta*. The description on page 223 (last sentence) reads "postbranchial membrane with 11 to 16 teeth", and Figure 8.25.C shows 12 teeth. There is also a difference in the number of teeth for *M. oculata*. In the key on page 175, couplet 6B reads "postbranchial membrane with about 5 coarse teeth". The description on page 225 (last sentence) reads "postbranchial membrane with about 10 coarse dentations", and Figure 8.26.C shows 6 teeth. We noted this discrepancy but did not have a solution or a correction to make.

At the end of the meeting for that day, a list was generated of the species that were included in the SCAMIT Species List but were not included in this MMS Volume. Those species were *Amphicteis glabra* Moore 1905, *Sabellides manriquei* Salazar-Vallejo 1996, *Schistocomus hiltoni* Chamberlin 1919, *Schistocomus* sp A SCAMIT 1987, and *Sosanopsis* sp A SCAMIT 1996 (listed as *S. wireni* by Hilbig).

On February 13, the second day of the meeting, we continued our work with Ampharetids and started by discussing *Pseudampharete mexicana* (see also above). *Lysippe mexicana* Fauchald is listed as a junior synonym of *P. mexicana*. We examined the type of *Lysippe mexicana* Fauchald and found 13 uncinigers, validating placement in *Lysippe*. SCAMIT contends that *Pseudampharete* Hilbig is incorrectly formed and should be a junior synonym of *Lysippe*.

Ampharetidae Genus A sp A Lissner et al is also listed as a junior synonym of *P. mexicana*. Leslie has examined this lot of specimens. They are variable in having 12 or 13 uncinigers, and are a mixture of *Lysippe* sp B and another undescribed species. Due to this mixed lot and uncertainty about which specimen is illustrated in Figure 8.21., it is not possible to definitively evaluate the description for *P. mexicana* in this chapter. We also examined the illustration of *Lysippe mexicana* in Fauchald 1972 and Uebelacker and Johnson 1984. Their unciniger illustrations did not match those in Figures 8.21.E and 8.21.F of the present volume.

We also noted that Ampharetidae sp 1 (=Ampharetidae sp SD 1) is a distinct species from those mentioned above.

Melinna heterodonta Moore, 1923 and *Melinna oculata* Hartman, 1969: In the key on page 175, delete the following from couplet 6A: "Segments 4 and 5 with neurosetae only, segment 6 with neurosetae and fine notosetae". Delete the following from couplet 6B: "Segments 4 and 5 with neurosetae only, segment 6 with notosetae only". The comment was made that the type of *M. oculata* needs to be re-examined. A couple of corrections were made to the schematic on page 171. For *M. heterodonta*, add notosetae to the 5th segment;

Figure 4 - *Melinna oculata*

these are very fine and are easily broken off, so they may be missed on general observation. For *M. oculata*, add needle setae to the 6th segment. See Figure 4 by Kelvin Barwick.

Next we made some changes to the descriptions for *M. heterodonta* and *M. oculata*. In the 3rd to last line on page 223, change "segment 6 with first notosetae" to "segment 5 with first notosetae". In the 2nd to last line on page 225, change "segment 6 with small notosetae" to "segment 6 with small often embedded row of neurosetae at base of notosetal fascicle". On page 227, in the Remarks section, in the 5th and 6th lines, change "*M. heterodonta* has" to "both have". On page 227, in the last line of the Remarks section, following "notosetae in segment 5" add "and neurosetae in segment 6".

Then we tackled the terebellids. First we made comments and corrections to the key. On page 235, couplet 4A states that there are 7 pairs of branchiae in *Streblosoma pacifica*, n.s., but in the text, it lists 5-6 (page 243). In couplets 5A, 5B, and 10B, methyl green does not have to be capitalized. In couplet 17A, page 236, change "(Fig. 149C)" to (Fig. 9.9.C)". In couplet 17B, page 236, change "Branchiae 1 or 2 pairs" to "Branchiae 1 to 3 pairs".

Amaeana occidentalis (Hartman, 1944): The comment was made to supplement these illustrations with the ones in Hartman 1969.

Polycirrus californicus Moore, 1909. We didn't find any technical errors in the text. We discussed the synonymy of *P. perplexus* with *P. californicus*. The holotypes of these 2 species differ in size substantially. We questioned the relationship of size and methyl green staining patterns in these specimens. SCAMIT agrees with the synonymy for now, until further examination of different sized specimens can be done.

Streblosoma pacifica Hilbig, new species. This is not the common *Streblosoma* sp B that we encounter in southern California. This species occurs at depths of 410 m-500 m and has not been reported by SCAMIT. We discussed the synonymies *Streblosoma* sp A Lissner et al and *S.* sp B Steinhauer and Imamura. *Streblosoma* sp A Lissner et al has been examined by Leslie and is confirmed to be *S. pacifica*. However, the listing of *S.* sp B Steinhauer and Imamura is indeterminable for *S. pacifica*. This is a "Sue Williams' animal", and the condition of the animal as well as the number of branchiae (Leslie's specimens had 5-6; Sue Williams' specimens had 7-9) makes this synonymy problematic. Kelvin Barwick examined a specimen of *S.* sp A under the microscope and saw 6 segments with branchiae, and a gap between setigers 2 and 3.

Thelepus hamatus Moore, 1905. This species identification is somewhat questionable as Hilbig refers to the "marginal condition of specimen" (page 246). Kelvin Barwick stained a specimen with methyl green, and we compared the staining pattern (shown in Figure 1; see cover) to the one described in the chapter. It did not match the pattern described on page 246 for *T. hamatus*. Additional material would have to be stained and examined in order to confirm this identification.

Thelepus setosus (Quatrefages, 1865): No comments.

Artacama coniferi Moore, 1905: No comments.

Next, we broke for lunch. Larry Lovell treated us to a slide presentation of a recent Scripps Institution of Oceanography working trip that he went on to Deception Island, Port Foster Bay, off Antarctica. He showed slides of the ship, the Lawrence M. Gould, a semi-icebreaker, the various grab and sampling devices that were used, and some of the invertebrates that were collected. We also saw slides of the many birds and mammals that were seen on the trip as well as spectacular slides depicting the natural beauty in that part of the world. Then back to worms!

Lanassa gracilis (Moore, 1923): No one at the meeting had seen the dorsal glands illustrated in Figure 9.7.A. To our knowledge these have not been noted in other descriptions of *L. gracilis*, but we are alert to look for them now.

Lanassa venusta venusta (Malm, 1874): There was a discrepancy in the number of double rows of uncini; the illustration, Figure 9.8.A, shows double rows through setiger 15, and the description says double rows through setiger 18. Our local specimens have double rows through setiger 15. We made the correction to the description to reflect the illustration and our local specimens. On page 252, 4th line from the bottom, change "double rows through setiger 18" to "double rows through setiger 15". We found Figure 9.8.C confusing because it is not clear whether the uncini start on setiger 1 or setiger 2 on the right side.

Lanice "conchilega" (Pallas, 1766): This species was described from the Netherlands. Leslie read some notes she had from Hutchings and Glasby 1988. Their specimen of *"L. conchilega"* had nephridial pores on setigers 4 through 10; the ventral pads on segments 2, 3, and 4 were fused; the prostomium was U-shaped with a bifid, corrugated, lateral lip; the peristome had a well developed lateral lobe; the lateral lobe on segment 3 was narrow and rectangular with a dorsal-lateral flaglike extension. Refer to the SCAMIT voucher sheet, Vol. 4 No. 11. *"L. conchilega"*

represents a species complex, and specimens from southern California do not match the specimen from the Netherlands examined and described by Hutchings and Glasby. Unfortunately, there is no sufficient description of the type specimen for comparison. We concluded to further examine and describe our specimens and then produce a voucher sheet.

Laphania boecki Malmgren, 1866: The only comments made related to the ventral bulge on setiger two illustrated in Figure 9.10.A. Leslie reported a raised, dorsal median glandular area on setigers 1 through 4 on specimens of *L. boecki* that she has seen, but no one had seen a ventral bulge on setiger two.

Loimia medusa (Savigny, 1818): The original description of this species is inaccurate. We consulted Hutchings and Glasby 1988 in which they re-described a neotype of *L. medusa*. Currently, we believe our local specimens do not match this description. We need to examine more specimens and document these character differences.

Neoamphitrite robusta (Johnson, 1901): The discussion concerned the question of combining the two genera, *Amphitrite* and *Neoamphitrite*. SCAMIT follows Hutchings and Glasby 1988 where they combine *Amphitrite* and *Neoamphitrite*. We will continue our use of *Amphitrite robusta*.

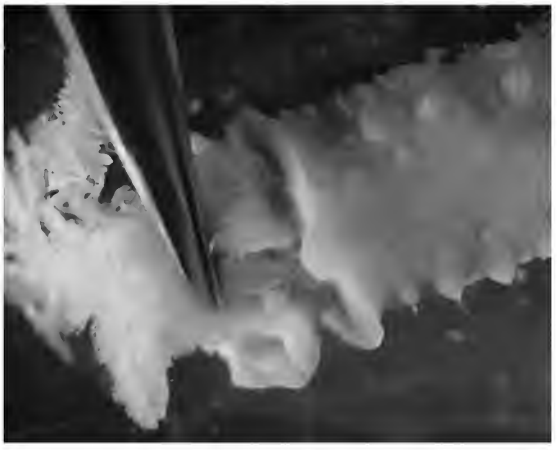
Neoleprea japonica Hessle, 1917: We compared characteristics of this species in this description with that of Hutchings 1997. Using the table on page 478 in Hutchings 1997 we found that the description in Hilbig's chapter has a shift forward of 1 segment. For now, we agreed to re-examine our specimens and use Hutchings' table for a reference.

Phisidia sanctaemariae Hilbig, new species: Discrepancies were noted between the two holotype illustrations of this species. This, in conjunction with Hilbig's synonymy of the familiar *Lanassa* sp. D with her new species, led to the following conclusions. On page 264, the last sentence, change "Setae of 2 kinds" to "Notosetae of 2 kinds". Figure 9.14.C shows 7 setigers with single uncini. This is in error; there should be 6. Modify setiger 8 to have double uncini. On page 266, 3rd paragraph, 1st line, change "Uncini in single rows through setiger 7" to "Uncini in single rows through setiger 6".

Pista agassizi Hilbig, new name: This species is a name replacement for other species that were confused in earlier published descriptions. (See Remarks section, page 267). *Pista agassizi* includes our *P. brevibranchiata* and *P. alata*. Leslie pulled a type of *P. alata* which had a transverse flap across the dorsum with accessory lateral lappets through segment 7. Our *P. alata* specimens which have those characters will now be called *P. agassizi*. In the description, Hilbig referred to segments 4,5,6, and 7 as having frills, as opposed to lateral lappets. This led to a discussion about the difference between a lappet and a frill.

Pista alata Moore, 1909: This is the true *Pista alata*. The type is from San Diego intertidal. Leslie stated that the only true *P. alata* have been found in the intertidal. This species has a forward projection on the transverse ridge

Figure 5 - *Pista alata*



which is illustrated in Figure 9.16.A. Leslie placed the cotype under the microscope for viewing. See Figure 5. We have not recorded this species from our monitoring stations.

Pista bansei Saphronova, 1988: This is our *Pista* sp B Williams.

Pista elongata Moore, 1909: No comments.

Pista moorei Berkeley and Berkeley, 1942: No comments.

Pista percyi Hilbig, new species: On page 278, in the legend for Figure 9.20., change "D-E" to "D-F". There was considerable discussion of questions that were raised about this species. The animals in Figure 9.20., appear to have characteristics that could be included in the description of *P. agassizi*. In the Remarks section on page 279, Hilbig uses the same argument for creating a new species here as she did for *P. agassizi*. SCAMIT believes that *P. percyi* should be a junior synonym of *P. agassizi*. The methyl green staining pattern of *P. percyi* is distinct; unfortunately, there is no stain pattern noted for *P. agassizi* for comparison. Our local specimens of *P. agassizi* (formerly *P. alata*) do show the same stain pattern as *P. percyi* perhaps adding justification for placing *P. percyi* as a junior synonym of *P. agassizi*. For the present both species are treated as valid pending investigation of *P. percyi*.

P. wui Saphronova, 1988: We questioned whether this is our *P. disjuncta*. At this point we were coming to the end of the meeting and decided to examine more of our specimens and compare them with *P. wui*. Further comments are pending.

Thanks to Kelvin Barwick and Kathy Langan for all their hard work and assistance with the minutes from the two day meeting. Good job!

My Life as a Biologist
by Donald J. Reish
Chapter 21: Retirement years

In the mid-1980s, I began to think about retiring. I was almost eligible for another sabbatical. I decided to take the year sabbatical (my 3rd) and then put in the minimum time afterwards and retire. My last class was in marine natural history in May 1988. I had planned a little speech outlining my 40 years of teaching from high school to CSULB. Suddenly, the door burst opened and about 15 of my former grad students ran in with a banner (which I still have) congratulating me. It was quite a pleasant surprise. Marion Nipper, who was working at SCCWRP, also came and she met Scott Carr there-the rest of their meeting is history (She works with Scott in Texas). Two years earlier at the SCAS May meeting, they conducted a roast for me. I think the best part of the roast was the presentation of 3 volumes of collected reprints by my former students. Jerry Barnard was also there-it may have been the last time that I saw him.

People view retirement in many different ways. Some faculty members leave the area, some stay put but not at CSULB-I do not know what they do. There is no one answer to how one should spend his/her time in retirement. But one thing is certain-you must plan for it. Not only what you do but also what you and your spouse plan to do. Planning should also include financial planning which should begin years (decades) before retirement. My interests, in not any particular order, include polychaetes, gardening, travel, wife and family. I chose to remain at CSULB and conduct some research, writing, taking care of the worm farm. After formal retirement, I was hired for several years to supervise student teachers. I didn't mind this since my schedule was flexible. Believe it or not, the University has just rehired me (recycle me?) in fall 2000 to reinstate the intern program. I had initiated this program before I retired. Again, scheduling is flexible.

Just before retiring, I became active in ASTM. I co-authored the west coast mysid toxicity test protocol followed by aquatic and sediment test protocols with polychaetes. I also co-authored the section on selecting test animals for toxicity testing. I had earlier written the polychaete aquatic test protocol for Standard Methods. I was invited to conduct a polychaete work shop at the Water Environment Federation meeting in Toronto. Janice went with me, but first we attended Stan and Kelli Asato's wedding before grabbing the plane. At the work shop I met Lenore Clesceri who later talked me into taking over the toxicity section of Standard Methods (SM). Since nothing new had been done in SM for the past few editions, there was a lot of leg work to do. I called upon former students to help me-Jack Anderson, Scott Carr, Joe Gully, Steve Bay, Joe Greene came through for me. The part coordinators (I am 1 of 10 plus 3 editors) meet each January to deal with the problems. We have met in AZ (3X), FL (soon to be 2X), LA (New Orleans-not Los Angeles), HA, and San Diego. I guess this is our fringe benefit. Lisa has been a paid artist for them.

Other scientific activities include attending SETAC meetings each year, and most of the 2 meetings/year of ASTM. I wrote a new edition of Marine Life of Southern California (1995) and I am thinking of doing another edition (3rd) in the next couple of years. Hopefully, it will have lots of colored photos-time will tell. It is easy to think of projects. Tom Gerlinger got me a contract with Orange County Sanitation Districts to conduct sediment tests with *Neanthes*. We published 2 papers plus a few posters at SETAC. Tom McDonnell hired me on a consulting job in LB Harbor and Karen Green is going to hire me to write about pollution history in LA-LB Harbors.

I served as the editor for the 3rd, 4th, 5th, and 6th polychaete conferences and will serve as editor for the 7th to be held in Iceland in 2001. If the 8th conference is held in a non-English speaking country, I will offer my services to check the English after the paper has been accepted. Years earlier I was the editor of the Bulletin of the Southern California Academy of Science. Remember, I was an editor at the age of 10, a sports editor in high school, and was initially a journalism major in college. I guess printer's ink is in my blood!

Next: I look back; I look forward.

NEW VOUCHER SHEETS!

In the "Taxonomic Tools" section of the website you will find voucher sheets prepared by Dean Pasko of CSDMWWD. The sheets cover animals as far ranging as Cnidarians , Crustaceans, Nemerteans and Platyhelminths.

OUT IN THE COLD

Hi everyone,
We are on our way home, nearly to Tierra del Fuego. The 36 hours in the Drake was rough, 10-15 ft swell and we were sitting right in the trough the whole time. Today is much better and the sea state is considerably calmer. Another 36 hours and we should be back to Punta Arenas. The collection will be getting some good material from this cruise. Not only the animals from Deception, but a trawl off King George Is. The King George trawl was loaded with many species of sponges, tunicates of several kinds, a couple of anemones and other cnidarians, bryozoans, 3-4 amphipod species, many polynoid scale worms, serpulids, nereids, nephtyids, other mud tube dwelling polychaetes, several pycnogonids including several specimens of the ten legged species *Decolopoda australis*, isopods, 3-4 species of bivalve and a couple species of gastropod, 4 octopus, many asteroids, ophiuriods, and holothuriods. There were a few fish, but not too many. The trawl probably weighed 500 pounds. The sponges and tunicates were the dominates. There are three 5 gallon buckets of material for the collection from that trawl alone, one contains the sponges "alone". But, I think that many small organisms will be found in the sponge bucket once it is emptied. When I opened one sponge

up there was one isopod and one amphipod inside. The material will not be back until March. It is going military surface freight to Pt. Hueneme, CA in a cargo van. Maybe I should host a SCAMIT "play day" in the collection when it arrives!

This has been a great adventure and while it has been great I am ready to go home. The ship was a great platform for working and the people were all very professional. We did get to visit a chin strap penguin colony the day we departed Deception. It was at Bailey Head and there are estimates that in excess of 100,000 pairs of penguins nest there. I shot two rolls of film and about 45 minutes of video tape. It was quite astonishing to see a vast expanse of beach and inland hillsides just covered with penguins. There was a "highway" of penguins going in and out of the water and heading inland to their nests. We stayed close to the beach and did not venture inland. Then we went to Pendulum Cove and went "hot tubbing" nature's way (no not naked!). We dug out pits in the beach sand where thermal springs were flowing and got in the warm water. Of course, we had to go into the frigid ocean water to cool off and then right back into the hot tub. Takes my breath away just thinking about it again. There were about 18 of us there (three zodiacs) and all but 2 or 3 went in. I had failed to bring a bathing suit with me, but, thankfully, was able to borrow one for the experience. That about covers the highlights since my last message to all of you. I will have email on the ship until Tuesday, Dec 5, so if you want to say anything back do it soon. I will be home on the Wednesday, Dec 6.

Worm regards from way down south,

Larry

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Southern California Association of
Marine Invertebrate Taxonomists

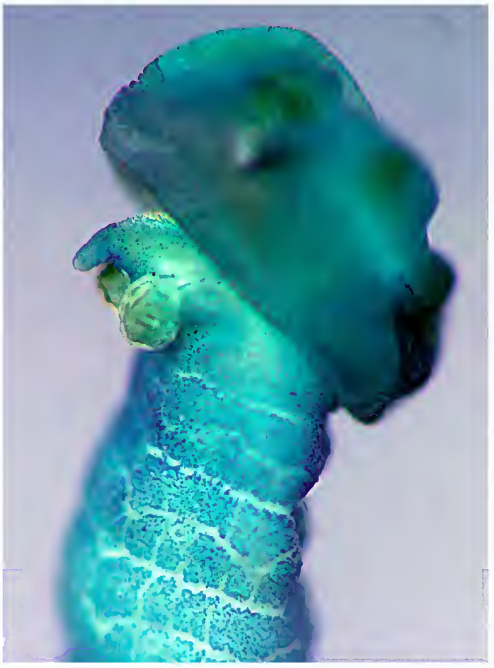
3720 Stephen White Drive
San Pedro, California 90731

March, 2001

SCAMIT Newsletter

Vol. 19, No. 11

SUBJECT:	Polychaeta: End of Volume 7 Discussions
GUEST SPEAKER:	Led by Leslie Harris
DATE:	11 June 2001
TIME:	9:30 a.m. to 3:30 p. m.
LOCATION:	Worm Lab, Collections Room LACMNH



Notomastus "latericeus" - Ant. Detail Methyl Green Stained
City of San Diego ITP I-2 Rep. 1 2Jan2001 108ft.
Tissue behind probosis (last abdominals shredded) removed in Photoshop to emphasize size of proboscis
R. Rowe
Max width 1.1mm & Length of thorax 4.5mm

For the next meeting,bring specimens of the as yet unfinished groups, Oweniidae, Trichobranchidae, and Terebellidae (in part), and any problematic specimens of other polychaete families. As usual, the polychaete type resources of the Allan Hancock Foundation, now at the Natural History Museum, will be available for consultation. The meeting will actually be held in the Collections Room, so late arrivers should go directly there (turn to the right at the "T" hallway intersection rather than to the left).

NEW LITERATURE

The sea-pansys, octocorals of the genus *Renilla*, were revised by Zamponi and Pérez (1995). Although their primary interest is in the fauna of the southwestern Atlantic and the sub-Antarctic, they did a world-wide revision. Our local species, *Renilla koellikeri* (note the umlauted ö is no longer admissable in nomenclatural use and must be translitterated to oe) is not discussed, but is included in the

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SCAMIT Newsletter is not deemed to be valid publication for formal taxonomic purposes.

key to the genus. It is instructive to follow their review of the characters within the group. Zamponi et al (1997) provide another similar overview (and adopt the translitteration mentioned above), which is further supplemented in Pérez & Ocampo (2001) with a cladistic analysis.

Cladistic analysis of the Octocorallia as a whole is undertaken by Berntson, Bayer, McArthur & France (2001) based on 18S rRNA data. Unfortunately the data included were not sufficient to resolve the branching order of the major clades, or alternatively, the existing morphological classification was not supported by the molecular data. Further attempts using different sequences seem indicated.

That plenty of room for reconsideration of morphological data seems to exist, is evident in Brinckmann-Voss (2000). She describes a new species of *Sarsia* in the paper, and clarifies an earlier representation of the hydroid stage as *Polyorchis penicillatus* (see Brinckmann-Voss 1977). Especially in forms with complex life-history, such misinterpretations of the relationship of a given life stage are difficult to avoid. As more and more species are cultured through both the hydroid and medusoid generations in the laboratory (as in Mills 2000), such misallocations based on inferential connection of field collected forms will gradually be eliminated from the picture, allowing further rectifications. In several groups (see for instance Brinckmann-Voss & Arai 1997) the hydroid stages of most species are either unknown or virtually indistinguishable, and the basis of classification remains the medusoid generation.

The 18SrRNA gene which proved unable to provide the data necessary to resolve relationships within the Octocorallia, was more successfully applied to the phylogeny of the Hydrozoa by Collins (2000). Perhaps differences in the individual sequences chosen did the trick, or perhaps other factors were of importance, but the analysis provided both expected and surprising results. The monophyly of the Hydrozoa as a whole was well supported by comparison with outgroups which included Anthozoa, Scyphozoa, Porifera, Ctenophora, Brachiopoda, Hemichordata, and Placozoa. A second data set with Anthozoa and Scyphozoa as outgroups was used to examine relationships within the Hydrozoa more closely. Collins, in a careful discussion, examines the results in light of the phylogenetic hypotheses they either support, refute, or incompletely address. Use of such molecular data provides a path around the morass of confusion resulting from competing systems based on the morphology of one or the other of the generations in the complex cnidarian life-cycle.

Pleijel 2001 provides a revision of the polychaete taxon *Amphiduros* which provides parallel treatments of the results of his investigation using both traditional Linnean classification, and the rankless nomenclature he champions. He finds *Amphiduros pacificus* Hartman 1961, our local species, to fall into the synonymy of *Amphiduros fuscescens* (Marenzeller 1875). So do all other nominate species in *Amphiduros*. Pleijel indicates he can find no characters which will define the various local "species" populations well enough to allow their separation. He points out that this finding of a single "cosmopolitan" taxon is against much current practice. It is indeed at variance with the usual perceptions of most SCAMIT members, that local species which have at one time been identified with European described forms, or forms from other distant locales, nearly always prove to be separable once examined in detail. Such cosmopolitanism is demonstrable in some groups which have been examined with molecular methods and found to be genetically identical or to vary only slightly in genetic makeup. Most SCAMIT members remain Missourian in this regard, only accepting cosmopolitan explanations when proof is "as plain as the nose on your face". Our approach

is in harmony with that espoused by J. L. Barnard, that oversplit taxa can be combined if shown to be inseparable without loss of information, while the reverse is not true.

Although we have attempted to concentrate on more adult individuals, at least in regional monitoring activites, the early juvenile development of ophiuroids remains a matter of interest. Sumida, Tyler & Billett (2001) cover a similar topic (asteroids rather than ophiuroids) from the Northeast Atlantic. Although none of the taxa considered occurs in our area, several of the genera are represented both here and in their area. Their discussions of developmental patterns in small juveniles of these species is of interest to us here.

ELECTIONS

Oh!, for malfunctioning machinery and hanging chads to give some excitement to this process! Voter participation in the current election has hit a new low. Fortunately for us, even zero votes would have yielded the same result; continuation of the same slate of officers. This is not really a failure of democracy, but rather a triumph of lethargy (which the lateness of the Newsletters hasn't helped). I urge readers to immediately make plans to run for office in the next election. This is not intended as a move to pursue an ideologically more attractive set of policies, but rather as a method of bringing choice back into the process. Ann Dalkey has indicated [Ann correct me if I am wrong] that this will be the final year of her service as treasurer. Fortunately we do have a member who has stated a willingness to work with her this year so that she can fill the large gap left by Ann's retirement from office. Other officers seem willing to continue (so far) but the process would benefit from at least a little competition. Think it over, then act for the benefit of us all - including yourself.

BACK FROM THE COLD

On 30 March Larry Lovell assembled a group of taxonomists in the SIO Invertebrate Collection to examine material returned from his recent cruise, and other Antarctic materials in the Scripps collection. This was Antarctic Play Day #1, although the main objective was work. Work got done, but there was plenty of enjoyment to go around. Doug Diener and Don Cadien worked on peracarids and pycnogonids, respectively; John Ljubenkov worked the cnidarians; Megan Lilly tackled ophiurans; Ron Velarde, Kelvin Barwick and Larry worked on various polychaetes; Kent Trego continued on mollusks; and Tony Phillips spread himself thinly over a number of taxa. Robin Gartman similarly played the taxonomic field.

Larry had everything well prepared for this visitation, and treated his guest workers well. He had assembled some of the pertinent literature from sources within the invertebrate collections area and from the adjacent Scripps Library. This was supplemented with literature brought by the participants. Inevitably, some bits of the diffuse literature were missing. Enough was available to allow identification or confirmation of prior identification on a number of taxa. We broke for lunch and resumed a bit later after a wonderful Thai meal. The day ended all too soon, with much material yet to be addressed. Larry and the other participants were enthusiastic about making this only the first of a series of forays into the Scripps collections. A second "play day" is currently scheduled for the 2nd of June. Any SCAMIT members interested in attending are welcome, as are other workers who can assist with the taxonomy of this interesting and exotic fauna. If you plan to attend please contact Larry at **llovell@sio.ucsd.edu** so he can figure how much coffee to brew, how many donuts to buy, and how many microscopes will be needed.

MINUTES MARCH 19 MEETING

The meeting was held at the San Diego Marine Biology Laboratory. President Ron Velarde opened the business portion of the meeting. He announced that the next meeting will be May 14 at the Natural History Museum in Santa Barbara. The topic will be problem bivalves. There are 3 upcoming meetings. On May 4-5, the Southern California Academy of Sciences meeting will be held at California State University, Los Angeles. On June 20-24 the Western Society of Malacologists are meeting in San Diego. On November 9-12 the Western Society of Naturalists will meet at the Ventura Beach Hotel in Ventura, California.

The guest speaker for today's meeting was Karen Green of MEC Analytical Systems, Inc. She went to Thailand a few years ago with Kirk Fitzhugh, Larry Lovell, and other polychaetologists to collect and identify the worm fauna. Karen was selected for her Maldanidae expertise, and volunteered to identify the Capitellidae. To improve the Capitellidae identifications and prepare for publication, Karen reviewed the literature and attempted to clarify the definitions of Capitellidae morphological characters. This presentation to SCAMIT is a summary of her Thailand Capitellidae identification work and a review of general external Capitellidae morphology.

Karen started with the review of morphology. She distributed two packets of handouts; the text handout, "Notes on Morphology of Capitellids" (which is the next section of this newsletter), described the morphology of capitellids, and the other handout consisted of illustrations of characters (see attachments at the end of this newsletter). These very informative handouts are included in this newsletter, and they are part of a manuscript that is in press. Karen found inconsistencies in the morphological terminology used in the literature. Her SCAMIT presentation and handouts define and consequently clarify the usage of several important terms.

After an interesting slide show presenting her "Notes on Morphology of Capitellids" and illustrations, we examined some specimens that Karen brought. Karen used the specimens to demonstrate the appearance and location of some of the structures that have been confused in the literature. Particular attention was directed to familiarizing attendees with the position of genital pores and lateral organs.

The first specimen was *Promastobranchus* sp. The methyl green stain encircled the intersegmental genital pores making them easier to see. On the first specimen there were 4 pairs of genital pores; however, on a juvenile specimen, there were only 2 pairs of genital pores. Caution must be used whenever identifying the smaller specimens of Capitellidae. We then looked for the lateral organs which occur on all thoracic segments in the Capitellidae. They are usually larger than genital pores, and are interramal and positioned closer to the notosetae than neurosetae. The lateral organs on this specimen did not stain with methyl green which is typical of the Capitellidae material Karen has examined.

We were able to view these interesting and difficult to detect structures using a digital camera mounted on a dissecting scope with images displayed on monitors. This City of San Diego system was operated by Kelvin Barwick and will be used at most future SCAMIT meetings. This set-up was an excellent way for all meeting attendees to view specimens and provides the additional benefit of capturing images for inclusion in future SCAMIT voucher sheets or other identification aids. The City of San Diego archives the collected images. In the near future a multimedia project will be added to the system to facilitate high resolution viewing by a larger audience.

Next we examined a specimen of *Notomastus latericeus* that Karen had identified from the Thailand material, to view the location of pores in the anterior abdominal setigers. The abdominal lateral organs were located posterior and ventral to the notosetae with the genital pores just behind the lateral organs (but actually at the anterior edge of the next segment). This posterior shift of the lateral organs is associated with the posterior shift of the setal fascicles in the abdomen (they are mid parapodial in the thorax). On this specimen the proboscis was protruding and was covered with small papillae.

The next worm we viewed was *Notomastus hemipodus*. Karen showed us two specimens; one had methyl green paired ventral stripes on the abdomen, and one did not. She found a few specimens in the same sample lacking the ventral paired "racing stripes" found on the majority of her Thailand specimens (and typically found on specimens in the Southern California Bight). Except the variation in ventral stripes, other staining patterns were consistent.*(*See the discussion about *Notomastus hemipodus* that follows in the review of the *Notomastus* key from the MMS Taxonomic Atlas.*)*

Karen put out a request for specimens of *Notomastus*. She wants larger specimens (at least1.5mm in width) that include the thorax and some anterior abdominal setigers. All species of *Notomastus* are welcome. She can be reached by e-mail at, **green@mecanalytical.com**.

The next specimen under the microscope was *Dodecaseta*. The proboscis was everted, flaring, and had multiple lobes around the periphery. In this species, the lateral organs do not uptake stain, but the surrounding tissue does, making the organs easier to detect. In the transitional (setigers ~10-13) and abdominal regions, the lateral organs protrude. Karen noted that *Notomastus* does not have transitional segments, but changes abruptly in segment structure between the thorax and abdomen. In the genera with a set of transitional segments, Karen suggested dissecting the specimen to see where the last septum occurs and determine the position of the last thoracic segment.

We subsequently viewed specimens of *Notomastus lineatus*, *Rashgua*, and *Notomastus tenuis*.

This newsletter summary of Karen's presentation represents a small part of the material she provided. Her preparation and knowledge was apparent to the attendees and the information she shared was appreciated. Thanks Karen.

Rick Rowe handed out Provisional Species Voucher Sheets of *Armandia* sp SD 1 and *Nephtys squamosa*. We had examined the specimen of *N. squamosa* at a previous SCAMIT meeting and identified it as such. These two handouts have been added to the SCAMIT website. Rick commented that all voucher sheets should be posted on the SCAMIT website as pdf 's (Portable Document Files). Adobe Acrobat and especially Adobe PageMaker provide the best distillers for producing pdf's although other software includes distiller capabilities.

Following a quick lunch, we began the review of the Capitellidae Chapter 4 in the MMS Taxonomic Atlas Volume 7.

Using suggestions from Karen's presentation, some corrections were made in the Morphology section and in the key. On page 47, in the 2nd paragraph under Morphology, last sentence, change "nephridial openings" to "genital pores". It was noted that the key on page 54 was constructed for adult animals and may not be suitable for juveniles. In couplet 11A, change "Thorax with 15 setigers" to "Thorax with 13 setigers". In couplet 8B, change "Thorax with 15 or more setigers" to "Thorax with 13 or more setigers". In couplet 10, add "asetous post peristomial segment" for

Scyphoproctus. Couplet 6A, genus *Notomastus*; Karen commented that there are problems within the genus *Notomastus*, and the key in this chapter is of limited utility because it works for only some of our local species.

We then discussed the species in the order they occurred in the chapter:
Barantolla: We were disappointed in the limited discussion of characters and the lack of additional figures since this description was based on a single, juvenile specimen.

Capitella: We decided to continue with the SCAMIT use of *Capitella* "*capitata*" complex which includes the variation of 4 anterior setigers with capillary setae which SCAMIT members encounter commonly.

Decamastus: We questioned the last sentence on page 61. We believe that the specimens Blake is referring to in the Remarks section are most likely juvenile specimens. It has not been acceptable historically to modify a generic description based on juvenile characters.

Dodecamastus mariaensis Blake, new genus, new species was described from two incomplete specimens. There was some discussion on where the thorax ends and the abdomen starts, since it was not clear from the illustration although clearly defined in the written description. A dissection to locate the septa would be advised. Also, the location of the lateral organs is not discussed or illustrated. If a lateral organ is present on the second of the peristomial biannulations, then that becomes an anterior asetiger and adds to the thoracic segment count.

Heteromastus filobranchus: Tony Phillips noted the different staining patterns of adults and juveniles in this species. Because these different staining patterns exist, caution should be used when identifying smaller individuals. Additional characters should also be used.

Leiochrides: There were no confirmed identifications from the members present.

Mediomastus: Larry Lovell commented that there is much variation in the staining patterns of *Mediomastus ambiseta* and *M. californiensis*. We will continue to use *M. acutus* as differentiated in the key on page 73. This species occurs in shallow water. For other specimens of *Mediomastus*, we will continue to use *Mediomastus* sp. There was a question about couplet 2B in the *Mediomastus* key on page 73. In the first line, should "thoracic and abdominal capillaries" be changed to "thoracic and abdominal hooks"?

Notomastus: On page 81, on the title line of *Notomastus hemipodus*, change it to *Notomastus hemipodus* not Hartman, 1945. Add to the synonymies list: *Notomastus* sp A and *Notomastus tenuis* not Moore 1909. According to Leslie Harris (see SCAMIT Newsletter Vol. 18, No.1, page 5), the animals that we have been identifying as *N. tenuis* (methyl green staining pattern of double ventral stripes in the abdomen) might be the same as this *N. hemipodus* described by Blake, but *N. hemipodus* was described by Hartman, 1947 from "intertidal zones to a few fathoms" from North Carolina. To avoid additional confusion and to reflect skepticism the disparate distributions introduce, SCAMIT will use the provisional *Notomastus* sp A for our common, offshore "double ventral staining stripes" form. Rick Rowe has completed a voucher sheet for this animal and it is posted on the website.

Notomastus tenuis: This is a shallow water species. Tony Phillips has recorded this species. On page 85, list *Notomastus* sp 1 as a synonymy of *N. tenuis*. In this species, the last thoracic segments are constricted. We will now use *N. tenuis* for our shallow water species. Leslie Harris has reviewed specimens and clarifies the usage of *N. tenuis* in the SCAMIT Newsletter, Volume 18 No. 1, page 5.

On page 86, Figure 4.15.A, change the label "nephridial pore" to "lateral organ". Make the same change to Figure 4.16 on page 88. These changes result from terminology usage suggested by Karen Green.

Notomastus magnus: We will continue to use *N. magnus* for our offshore specimens; however we need to look closer at setal types to determine whether they are the same species as Blake's *N. magnus*.

Neoheteromastus: This is a deep water species, and we have not reported it.

Neomediomastus: This is a deep water species, and we have not reported it.

The following genera are listed in the SCAMIT species list but were not covered in this chapter: *Anotomastus*, *Dasybranchus*, *Dodecaseta*, and *Scyphoproctus*.

NOTES ON MORPHOLOGY OF CAPITELLIDS
By Karen Green

The following notes are excerpts from a recent manuscript prepared on capitellids from the Andaman Sea off Thailand. That paper provides an overview of regional studies, morphology, keys to genera and species, and descriptions with illustrations for over 30 species representing 15 genera. Publication of the paper will be in a special volume of the Phuket Marine Biological Center Research Bulletin, which is being edited by Dr. Danny Eibye-Jacobsen.

Review of Morphological Characters:
The primary key characters that have been widely adopted to identify capitellids are the number of thoracic setigers and setal distribution. Although Fauchald's (1977) key and definition of capitellid genera followed the traditional system based on setal distribution, he considered the subdivision of capitellids in need of revision. The need for revision of the family has been echoed by recent authors (Ewing 1991; Blake 2000), who point out that the high percentage of monotypic genera and use of thoracic segmental and setal distributions as the basis of the generic descriptions is unsatisfactory.

Several authors have pointed out that setal distribution, particularly in the posterior thorax, may change with age. Ewing (1982, 1984) and Blake (2000) have pointed out that juveniles may have fewer setigers with capillary setae than observed in the adult condition. Warren (1991) and Warren et al. (1994) conducted recent reviews of *Capitella* and *Mediomastus* and discussed the relative usefulness of various hard and soft characters in defining capitellids. These authors considered the number of thoracic setigers (rather than segments) with capillary setae occurring in adults a reliable generic character, particularly when the distinction between the thorax and abdomen is clear, but caution against stating the total number of thoracic setigers when the distinction between the thorax and abdomen is indistinct.

Other features such as appearance of thoracic and abdominal segments, body shape and size, branchia, lateral organs, genital or nephridipores, number of asetous segments, proboscis, pygidium, shape and appearance of the prostomium, structure of setae, and more recently methyl green staining patterns have been used to differentiate species. Warren et al. (1994) considered setal structure the most decisive character for distinguishing *Mediomastus*. Several of the above- mentioned features have been considered unreliable, difficult to assess, or diagnostic only at the species level.

The following review of morphological characters is based on assessment of characters that were used to identify a couple of hundred specimens from Thailand.

Head. The prostomium has few forms in capitellids. The shape may be rounded, conical, or elongated at the tip in the form of a palpode. The shape may vary among species.

However, the palpode may be retracted and frontal view of rounded prostomiums should be done to verify whether a retracted palpode is present or absent. The prostomium may or may not have eyespots, which may be paired or may form a diffuse pattern. They occur anterior to nuchal organs, and do not occur on the peristomium as indicated by Warren et al. (1994). They may not be visible in all specimens of a collected species, and use of this character should be with caution. Nuchal organs occur in slits at the base of the prostomium and may be everted in some specimens as a result of preservation. They may be impossible to see in small specimens, and may be difficult to see in larger specimens if the prostomium is somewhat retracted into the peristomium.

The probocis often is retracted, but when everted varies from being globular or sac-like to lobed. The surface may appear smooth or papillated, and the degree of papillation may vary between distal and proximal regions. While it is has been observed that several genera share similar proboscideal characteristics, sufficient variation in this part of the anatomy occurs to warrant additional investigation regarding taxonomic usefulness. Members of *Dodecaseta* were found to share a similar lobed proboscis, which clearly differs in appearance from the proboscis seen in *Notomastus*. This as well as other morphological differences argue against the synonymy of *Dodecaseta* with *Notomastus* as proposed by Blake (2000).

The peristomium typically lacks setae. However, the occurrence of setae on the peristomium has been reported for a few genera, and has been considered a generic-level character. Subsequent review has clarified that this probably is not the case. For example, Warren (1991) reported that the peristomium in some species of *Capitella* may be difficult to see in preserved specimens and so indistinct as to be easily interpreted as being fused with the first thoracic setiger. Although *Capitellethus* has been reported to have setae on the peristomium (Hartman 1947, Fauchald 1977, Amaral 1980), it is believed this was misinterpreted from the drawing by Ehlers (1907). Review of several species of *Capitellethus* from Thailand indicates that the peristomium lacks setae. *Nonatus* Amaral (1980) is another genus that was described as having setae on the peristomium. However, it is suspected that Amaral (1980) misinterpreted the first thoracic setiger as being the peristomium. Review of his illustration shows the prostomium to be partially retracted into the peristomium, which is clearly illustrated as being anterior to the first setiger with setae.

Thorax. The junction between the thorax and abdomen in capitellids typically has been defined based on a change in the type of setae, change in the development of the parapodia, change in body width, or occurrence of a more distinct intersegmental groove. With the exception of Eisig (1887), who included meticulous illustrations of internal anatomy, the thorax has not been defined relative to correspondence to internal anatomy. For some species, the change in segment appearance between the thorax and abdomen is obvious. However, for many others, there is no apparent change in body appearance. In those cases, a change from capillary setae to hooded hooks or from one type of hooded hook to another type typically has been used to define a thorax/abdomen junction.

In some taxa, there are transitional segments that have capillary setae in the notopodia and hooded hooks in the neuropodia or setigers with mixed fasicles of both capillary setae and hooded hooks. In a few cases, a change in body appearance occurs on a different segment than a change in setae. In these cases, the definition of the thorax has depended on the interpretation by the author, and there are differences in how different authors have interpreted these changes in appearance.

Without reference to internal anatomy, descriptions of the thorax/abdomen junction will continue to be problematic, particularly for species that lack correspondence of an obvious change in body appearance with a change in setae. Characters that may vary between the "thorax" and "abdomen" include setae type and appearance, position of setae within a segment (e.g., more central in thorax, more posterior in abdomen), development of parapodia, location of genital pores, and methyl green staining patterns. None of these characters are foolproof, and must be considered in combination.

Lateral organs. Many species descriptions lack reference to the lateral organs or indicate that they were not observed. Lateral organs occur in the interramal space between the noto- and neuropodia, closer to the notopodia, on most segments. They do not occur on the peristomium. In specimens with an uniramous first setiger, they occur ventral to the notopodia in line with the lateral organs on subsequent setigers. In species with an asetous post-peristomial segment (e.g., *Scyphoproctus*), they occur in the same position on that segment as they do on subsequent setigers. In some genera they are obvious in both the thorax and abdomen, in others they are apparent only on the thorax. In small specimens (including some genera), they are not detectable at all.

Lateral organs typically are flush with the body wall, but may protrude from the abdomen in some species. Some descriptions have erroneously referred to protruded abdominal lateral organs as branchial vesicles.

Methyl green stain is useful for distinguishing lateral organs either because they do not stain or they stain a lighter color than the surrounding segment. Methyl green stain is not an aid for identifying lateral organs on the abdomen when there is no uptake of stain in that part of the body.

Intersegmental genital pores. Paired pores may occur between the segment boundaries of several setigers in the thorax and/or abdomen. The pores occur nearly in line, but slightly ventral and posterior to the lateral organs. These pores were referred to as genital pores by Eisig (1887), genital or nephridiopores by Hartman (1947), and have been variously referred to by these terms by subsequent authors. These pores may not be detectable on all specimens of a species, even those of the same size and in the same collection. It has been hypothesized that they become apparent in sexually mature individuals. Limited dissections examining the relationship between the pores and nephridia have only been presented by Eisig (1887).

The term genital pore is preferred to avoid confusion with nephridia, which may occur in more segments than indicated by genital pores. For example, Eisig (1887) indicated that *Notomastus lineatus* has genital pores between the segmental boundaries of setigers 8/9, 9/10, and 10/11 and illustrated that nephridia also occur in abdominal segments without enlarged exterior pores. Similarly, he illustrated that *Dasybranchus* has paired nephridia on more segments than indicated by the genital pores.

Paired genital pores may occur in the intersegmental grooves of the last several setigers of the thorax, also occur in the intersegmental boundaries of the first few abdominal setigers, or may be restricted to the abdomen. Abdominal genital pores occur at the anterior region of the segment posterior to the lateral organs of the preceding segment. Methyl green stain may enhance the detection of genital pores. The area around a pore may stain darker or lighter than the surrounding portion of the segment.

Setae. The appearance and location of different types of setae have been the main diagnostic features in capitellids. The number of setigers with capillary setae has formed the basis of most taxonomic keys of the group.

Terminology used by Hartman (1947) and Warren et al. (1994) is useful for describing features of the hooded hooks. Key features include the dentition above the main fang, the development of the shoulder, length of shaft, development of node and constriction, and length and appearance of the hood.

Hooded hooks may vary between the thorax and abdomen, and between notopodia and neuropodia. These potential differences are not mentioned in most species descriptions, which may include only an illustration of an "abdominal hooded hook" without reference to setiger or location relative to noto- or neuropodia. An important exception is Warren et al. (1994), who contrasted thoracic and abdominal hooks in their review of *Mediomastus*. Other exceptions also occur, however, critical review of genera and species associations is severely hampered by existing literature, in which there is a general lack of illustrations of hooded hooks in different parts of the body, views of hooks in only lateral profile, or views of only the distal portion of the hooks without illustrating the node or posterior shaft. There also are numerous examples of papers that include species descriptions without any illustrations of setae.

The dentition of hooded hooks and features of the hood have been demonstrated with scanning electron microscopy (SEM) to be much more complicated than possible to discern with light microscopy. Some authors recommend SEM over the light microscope for evaluation of setae. Although SEM is unquestionably valuable, it is this author's opinion that it should be used to augment and not replace drawings of setae made using light microscopy. Several features of the hooks that have diagnostic value and that are visible with light microscopy include the overall appearance of the exposed and embedded parts of the setae, relative lengths of shaft and shoulder, development of node and constriction, and relative length of hood. Due to the small size of capitellid setae, slide preparations often are required and must be examined using high magnification and oil immersion to adequately evaluate their characteristics.

The number of teeth above the main fang is difficult to assess with light microscopy and can only be assessed with a frontal view of the hook, which can be difficult to obtain. The number of teeth seen in profile view may not accurately indicate the number of rows of teeth since in most slide preparations the hook is actually slightly rotated; in that case, teeth that occur in the same row may appear separate above the main fang, and may give the false impression of different rows.

Some authors have pointed out that setae may change during ontogeny, and that specimens of the same species have the potential to be identified as different genera during immature or adult stages using current generic definitions based on the number of thoracic segments and setal distribution (Warren 1991, Blake 2000). Some species have a fixed number of setigers with capillary setae from juvenile to adult stages. Other species have a variable number of setigers with capillary setae between juvenile and adult stages. In a some species, the number of setigers with capillary setae is variable among adult specimens. There has been an inconsistency in the literature regarding the taxonomic importance of the variability in setal distribution. Numerous monotypic genera have been erected to accommodate species that vary in the number of setigers with capillary setae. In this author's opinion, this convention should be discontinued, and all generic diagnoses based on setal distribution should be critically reviewed.

Branchiae. Branchia may occur on abdominal segments of some species. Branchiae have been used as a differentiating character to define some genera. Other genera may include both species with and species without branchia. Branchiae may include branched or simple

digitate protruberances, or in some cases parapodial lobes have been referred to as branchia. The respiratory function of parapodial lobes has been largely inferred in existing literature without reference to blood vessels or physiological investigation. Branchiae may or may not be associated with noto- or neuropodia. The location and appearance of branchiae are diagnostic at the species level. The use of branchiae as a generic level character deserves additional evaluation.

Pygidium. Most species descriptions have been based on anterior fragments. Key features of the pygidium include presence or absence of caudal cirri, anal plate, asetous pre-pygidial segments, and/or occurrence of spines. Examination of several species of *Scyphoproctus* from Thailand indicates that the number of spines in the anal plate is not a fixed character for species of this genus and may be somewhat size dependent.

Glands. Methyl green stain has been used to highlight the distribution of gland cells in the epidermis in maldanids (Green 1987, 1991, 1997), and this technique also has been used to stain capitellids (Ewing, personal communication; Warren et al. 1994; Blake 2000). Methyl green stain was found to be useful for evaluating characters such as lateral organs and genital pores and for discriminating species represented in the Thailand material. However, variations in methyl green stain was found to occur among specimens of the same species and similarities in stain were observed among different species. Therefore, staining patterns should never be used as the sole method of identification and should be used in addition to conventional character analyses. To increase the utility of this method, it is important that staining patterns, including their variations, be illustrated for a species.

The method used by this author consisted of placing specimens in a shallow dish of 70% alcohol darkly pigmented from methyl green granules (e.g., shallow dish must be picked up to detect worm). Worms were immersed for about one minute, then placed in a dish of clean alcohol to leach excess stain. After leaching the stain (about one minute), the specimen was placed in another dish of clean alcohol for evaluation of the staining pattern. Staining patterns were evaluated when the stain was only retained by gland cells and had leached from non-glandular parts of the body. This author has found that immersion in a concentrated methyl green solution permits a shorter immersion time than more weak solutions and speeds the stain evaluation process.

NORTHERN NEIGHBORS
M. Lilly

On St. Patrick's day I had the luck of the Irish in being able to attend a meeting of our northern sister association, NAMIT. The meeting was held at the Poulsbo Marine Science Center in the town of Poulsbo, Washington. The day began at 10:00 a.m. with approximately 20 people present. Michael Kyte was the opening speaker for the day and covered many aspects of ophiuroid biology and taxonomy. Initially he passed around a hand-out from the ophiuroid web-site, entitled "The Ophiuroids: What are they?". It gave an overview of the anatomy, physiology and biology of the group. You can visit this site at:

http://home.att.net/~ophiuroid/what.htm

He then discussed some available and useful ophiuroid literature. The most recent book is by Hendler et al 1995, but deals almost exclusively with Caribbean species. There are some ecology papers being published and there is an echinoderm list server which at the moment has some running discussions concerning ophiuroid feeding behavior. The bulk of the literature dealing with systematics is fairly old. One well known paper in this

category would be Lyman, T. 1882, Ophiuroidea. Report of Scientific Results Challenger. There are also two papers by H. L. Clark, the first being Clark, H.L. 1911, North Pacific Ophiurans in the Collection of the United States National Museum, and, Clark, H.L. 1914, Growth-Changes in Brittle-Stars. Two other pieces of literature mentioned were, Clark, A.M. 1970, Notes on the Family of Amphiuridae (Ophiuroidea) and D'yakonov, A.M. 1954, Ophiuroids of the U.S.S.R. Seas. – Keys to the Fauna of the U.S.S.R.

Michael believes that one of the most valuable keys to the ophiuroids is unpublished and was produced by Jack Word in 1983. He had a copy of it with him and stated that few people possess it or can obtain a copy. If you have access to this work, consider yourself lucky. Overall, Michael felt that the taxonomy and systematics of the group was fairly stable.

We then moved away from the literature and into the animals. There are approximately 13 species of ophiuroids on the inner continental shelf of Puget Sound. As depth increases so does species diversity, with new families appearing below 200m.

A question arose concerning some ophiuroids seen in the shallow waters near a member's home. This prompted a lively discussion about some of the more common local species witnessed by people present. Michael talked about seeing "forests of arms" belonging to *Amphiodia periercta*. The animals have their disks buried 20 cm down in the substrate and their arms come up through holes in the mud to facilitate their detrital suspension feeding style.

Michael then handed out his key and species checklist for us to peruse, and began speaking to the ecology and feeding behaviors of the groups. He started with *Gorgonocephalus* which is a suspension feeder. It has a double hook arrangement on its arms which capture zooplankton. The jaw structure has spines and teeth which the arms are periodically dragged across, thus freeing the zooplankton caught on the arm hooks. Michael likened the action to someone licking the food off their fingers. He discovered the hard way that these animals don't like to be tagged and will use their arms to reach around and pull a tag out of their disk, damaging themselves in the process.

The life history of the gorgonocephalids is interesting. They are broadcast spawners with planktonic larvae. The larvae eventually metamorphose into small *Gorgonocephalus* with initially only one branch per arm. The juveniles prefer to sit on soft coral but have been seen using hydroids or other animals that provide vertical relief from the bottom. The question was then raised as to whether they preferred cnidarians? The answer was that they seemed to, but no one was certain. When they are a little larger, but still not mature, Michael has seen them attached to adults.

The next genus up for discussion was *Ophiopholis*. The members of this group spin a mucus net between their tube feet and arm spines. Detrital suspension feeding then takes place with the tube feet forming a bolus of material and passing it down the arms to the jaws.

Members of the Ophiuridae are considered a typical, common brittlestar for the area. They live on sandy bottom habitats and are distinguished by their arm combs. Michael felt that they used a combination of techniques for feeding, one being predatory using an arm loop system to capture prey, as well as being detrital suspension feeders.

The Amphiurids, it was noted, contain the most commonly found species and inhabit a wide range of habitat and substrate types. They are the most difficult family taxonomically to deal with in that there are many relative descriptors ("smaller than" etc) in much of the literature dealing with the group. In addition there is a wide range of variation for which to allow.

We then moved on to the "nitty-gritty" and reviewed the oral structure of the different families. There was much discussion and confusion in regards to certain patterns and what exactly defines "infradental papillae", etc. Once that was relatively straightened out, Michael cautioned against the practice of storing ophiuroids in formalin. The acidity eventually dissolves the animals. He recommended either ethanol or simply drying them. (As a personal note, I find that many of the structures that need to be seen for identification purposes are much more clearly viewed if the animal is dried prior to examination).

In closing for the morning, Michael began a discussion on the general ecology of the area. Charles Birkeland conducted a survey of the fauna of Puget Sound in 1964. At that time there was a "bath tub ring" of *Ptilosarcus gurneyi* completely surrounding the Sound. In the mid 1990's a second survey was done by Michael who discovered that most of the sea pens had disappeared from Birkeland's study areas. From the 100 - foot contour to the intertidal, almost no *P. gurneyi* were found. There are still a few, small spotty populations in some areas, but nothing compared to the original density. Many suggestions were given for why this could have happened, but the bottom line was that it still remained a mystery. Michael also pointed out that with the loss of the sea pen population, many of the species which depended on *P. gurneyi,* whether for food or habitat, have also seen major decreases in density. Brian Gregory (of NAMIT) has been studying *Stylatula* and *Virgularia* in Hood Canal and has also noted a large decline in those sea pens.

Roland Anderson, from the Seattle Aquarium, then mentioned a trend he's been noticing. There seems to be a large influx of *Pisaster ochraceus* into the area, which represents a shift from the commonly seen asteroid, *Evasterias trochelli*. Roland also noted the increased presence of an introduced clam, *Nuttali obscura*.

So, although I have always thought of our northern neighbors and their habitats as more pristine and undisturbed than our beleaguered water ways here in Southern California, I must acknowledge that the problems we are seeing today in many of our marine habitats are more widespread than I'd previously cared to believe.

At this point pizza was brought in from a local restaurant and was heartily consumed by all. Val MacDonald took advantage of our captive, chewing state and distributed a simple, but wonderful hand-out to aid in the identification of juvenile bivalves encountered in Puget Sound. She had quietly and efficiently been setting up viewing stations around the lab while people were eating, so that by the time we finished we could wander from table to table and examine the specimens she had put forth on display. The hand-out proved quite useful in trying to identify some of these tiny bivalves.

All in all, I have to say that I thoroughly enjoyed myself and wish that I could visit our northern sister association more often. The members present were enthusiastic and hard working, and I'm hoping to maintain contact with many of them for future specimen and idea exchange.

MY LIFE AS A BIOLOGIST
Donald J. Reish

Chapter 22: I look back-I look forward

Obviously at the age of 76 at the time of writing, there are more years behind me than ahead of me. How does one evaluate one's contributions to biology and science? I am no

different from anyone else–I think of myself as being more important than I actually am. I think that I made important contributions in two areas: teaching and research.

As far as teaching is concerned, let us first consider the numbers. I taught 175 students in high school, 325 as a TA at Oregon State in general zoology, invertebrate zoology and parasitology. I had 30 students as a TA and instructor at Oregon Institute of Biology, 40 students as an instructor at USC in general biology, and approximately 2800 at CSULB where I taught general biology (107), general zoology (86), nature study (361), marine natural history (846), invertebrate zoology (686), algae (68), invertebrate systematics (226), polychaetes (46), oceanographic techniques (35), interns (64), seminars (90) and an estimated 200 student teachers. There were 57 who completed their masters degree under my direction as I had named earlier.

What was the impact of my teaching on these students? As my high school student said one time to me,"Mr. Reish is this your first year of teaching?" I said yes. She replied, "I thought so." I saw two of my high school students at my wife's sorority reunion in 2000. I had not seen them for 53 years. They remembered me and we had a pleasant time talking about our times 53 years ago.

At Oregon State I got at least two interested in marine biology both of whom made a name for themselves–John McGowan at Scripps and Bill Burns who was head of the Zoology Dept. at Wisconsin.

CSULB is where I believe I had the greatest impact. Over the years of setting through probably at least 1000 classes in junior and senior high school science classes, I wondered what makes a good teacher. I came to realize that teaching is an art–it is a product of one's personality, his interest in people, his love of the subject matter, and desire to do something truly worthwhile. He must exhibit enthusiasm and sometimes be a bit of a ham. A few of the techniques I employed were singing marine biology songs, running over the rock jetties, having snail races in invert zoology classes. These devices were done with a purpose in mind–another way of showing my enthusiasm for biology and teaching. As I discovered in supervising student teachers, not all people can become good teachers. You must work at it. In labs, I tried to spend a little time with each student on a one to one basis so that I got to know them better. I wasn't 100% successful–no one is, but I believe that I had some lasting effect on many as indicated by their interest in my story.

What was my impact on science, in biology, in invert zoology, polychaetology? I think that I am perhaps the primary person to scientifically popularize polychaetes. My work on polychaetes as indicators of pollution lead to the necessity of including polychaete identification on all marine monitoring programs. The impact of the importance of sieve size in screening benthic samples facilitated this. I think that speaking up for polychaetes also helped to make people polychaete conscious. The earlier benthic studies look primitive by todays standards, but the principles were established by then. As I demonstrated with my students, you do not have to attend a marine biology station to be able to culture marine animals. Polychaete cultures are now being established in marine countries. I get reprint requests and advice for culturing polychaetes even today. In fact, some colleagues have suggested that I go back to it. I probably will not.

I was trained as a classical zoologist, and I have described some 20 new species of polychaetes, some of which are not considered valid today. I think that my impact on polychaete systematics is minor. However, I believe that polychaete systematics is important and I will continue to support it.

Jerry [Barnard] and I did the first toxicity tests with polychaetes with *Capitella* in the harbor. It was nearly 10 years later before I did my second one. This lead to the EPA grant that I described earlier and lead to the establishment of the many cultures including *Neanthes arenaceodentata*.

I began writing toxicity test procedures for Standard Methods, ASTM, EPA, US Army Corps of Engineers and the Food and Agriculture Organization of UN. I plan to continue this activity as long as I can make worthwhile contributions.

What does the future hold for me? What would I like to do? What would I like to accomplish? At age 76 health is of prime importance in dictating what one can and can not do. I attempt to keep my weight steady, Janice and I try to walk 2 miles a day (running is a past effort for me–my joints lack sufficient cartilage). One fortunate thing is that we have enough savings and earnings so that we can do many things. We'd like to do more traveling to foreign places as long as we can. We would like to visit the Amazon, New Zealand and Australia again, we always enjoy Europe, we would like to do a land/garden tour of Japan. Hawaii is always calling; I can not remember how many times we have been there, but it is always great when we do. US and Canada have lots of great places to see again or for the first time. I will continue to garden and Janice will continue to knit. What about Science? My contributions to original research will be minimal if at all. I will continue to help others. My role as editor of the polychaete proceedings has been valuable to others. I am looking forward to editing the proceedings of the 7th polychaete conference to be held in Iceland this July. I will continue working with Standard Methods at least through the 2002 edition and maybe the 2006 edition. I will continue with the help of 4 others to do the annual marine pollution review for the Water Environment Research journal. I am assisting a colleague in Japan and England which may or may not result in any publication. Janice and I plan to continue to live where we do until we move to our final residence overlooking the 605 freeway.

A final note: This has been fun for me and I may write an up date of my happenings from time to time.

[Editor's Note - This is the last installment of a rather remarkable living documentation of the life of Dr. Donald J. Reish, mentor to many SCAMIT members, and conspicuous member of the scientific community in southern California and the world. He is still very much alive, and this final chapter may yet be superceded if he chooses to comment further on what has or will transpire in his life. SCAMIT is grateful for the opportunity to run this series of reminiscences, and looks forward to events yet to come.]

AND ANOTHER...

Dean Pasko has created a voucher sheet for Rhabdocoela sp A. You will find it attached to this newsletter (paper version) or in the Taxonomic Tools section of the website (electronic version).

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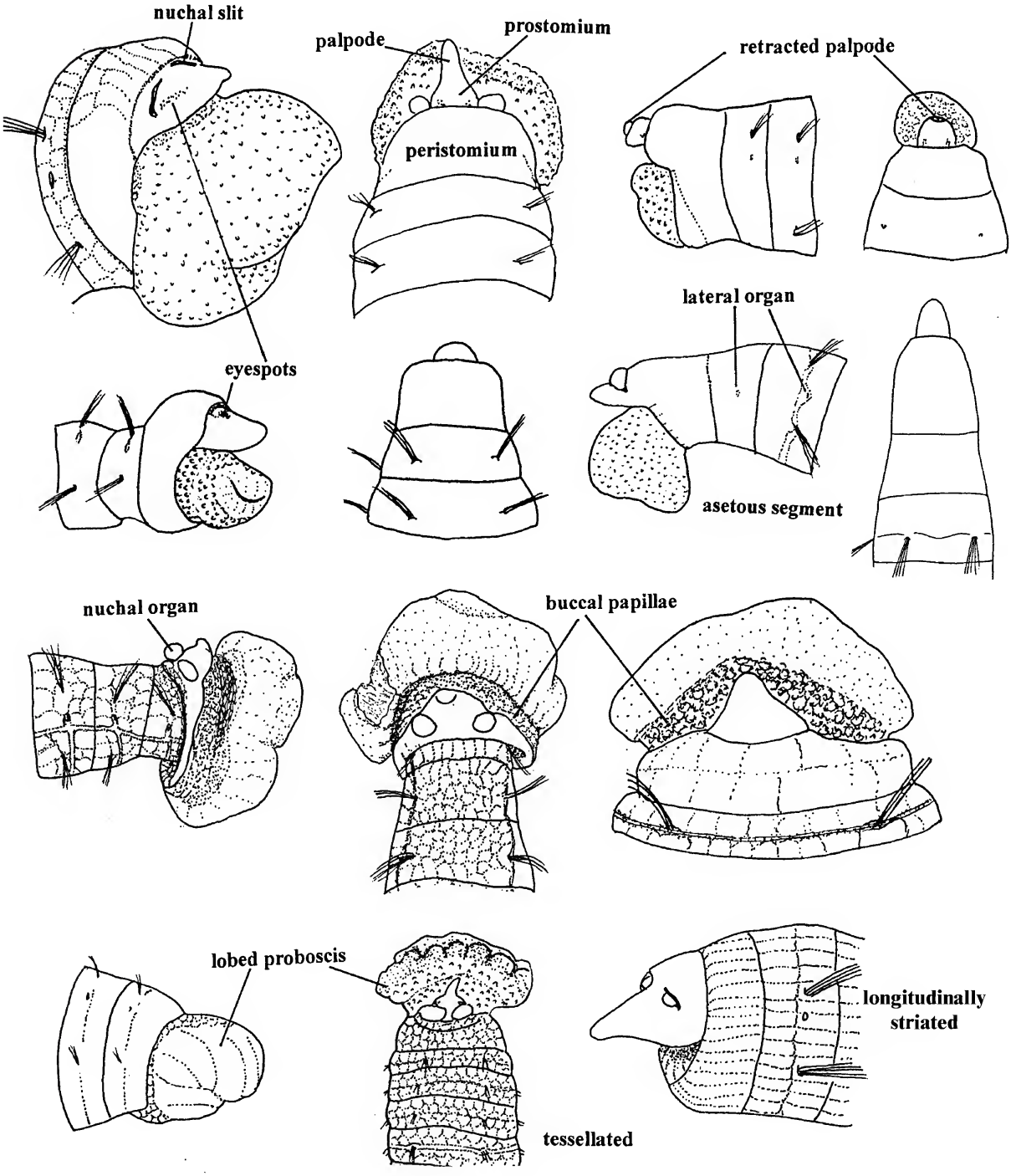
Back issues of the newsletter are available. Prices are as follows:

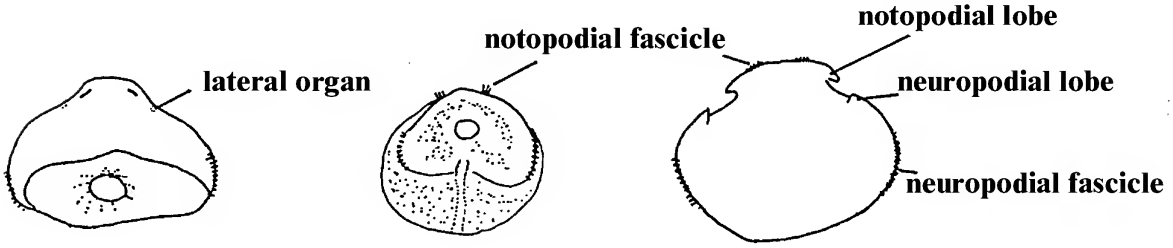
Volumes 1 - 4 (compilation).....$ 30.00
Volumes 5 - 7 (compilation).....$ 15.00
Volumes 8 - 15 ..... $ 20.00/vol.

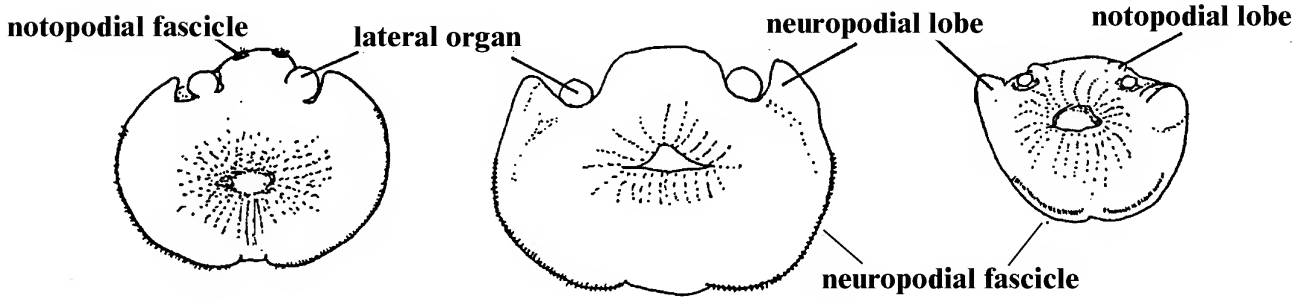
Single back issues are also available at cost.

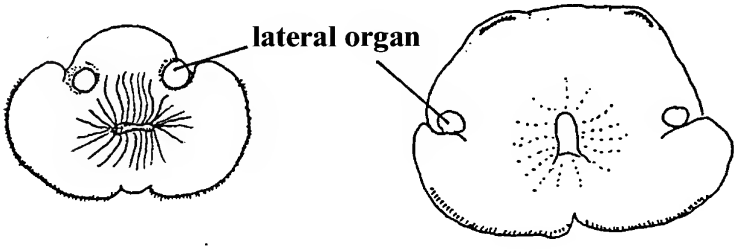
Anterior Views Illustrating Nuchal Organs, Eyespots, Lateral Organs, Proboscides, and Body Appearance
- by K. Green



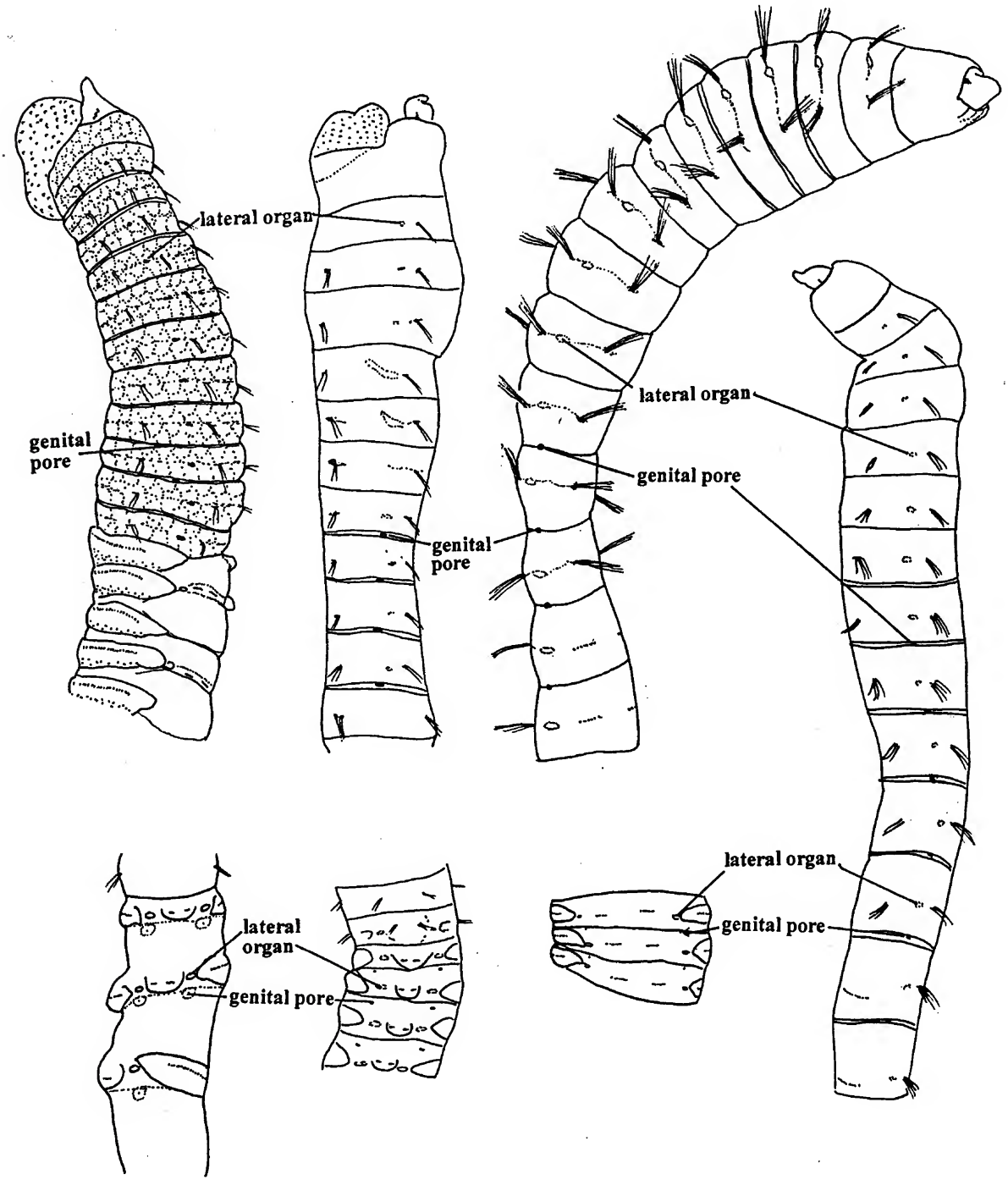
Abdominal Lateral Organs and Development of Parpodial Lobes and Fascicles - by K. Green



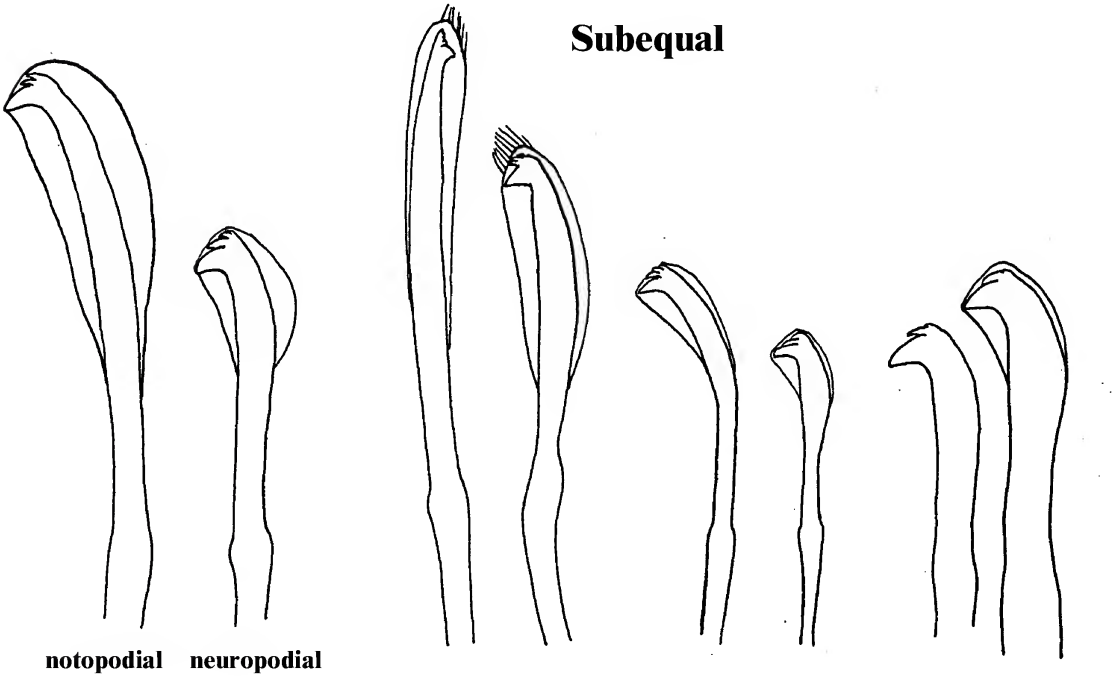


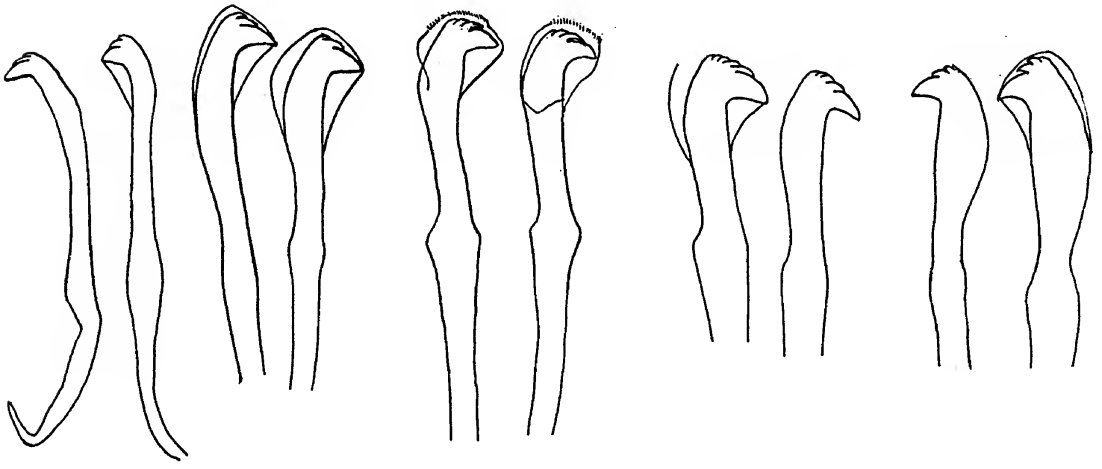


Location of Genital Pores
- by K. Green



Notopodial and Neuropodial Pairs of Hooded Hooks - by K. Green





Southern California Association of
Marine Invertebrate Taxonomists

3720 Stephen White Drive
San Pedro, California 90731

April, 2001

SCAMIT Newsletter

Vol. 19, No. 12

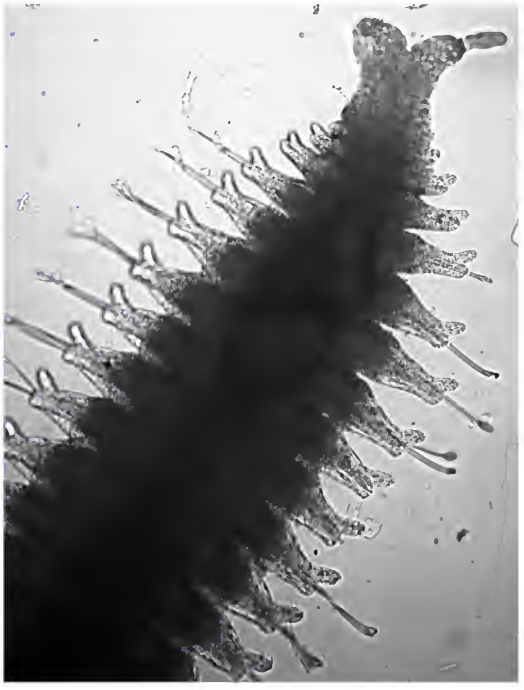
SUBJECT: No meeting in July; see below

GUEST SPEAKER:

DATE:

TIME:

LOCATION:



Lumbrineris nr *limicola* Hartman 1944
(posterior of animal with pygidium)

Next Meeting: No meeting will be held in July. The August meeting is not yet finalized. Details will be announed in the May NL. Those whom this leaves with time on their hands can do a final sweep of their data for changes, or comments, additions to and eliminations from the SCAMIT species list. Send any modifications to Don Cadien at **dcadien@lacsd.org**, call them in at 310-830-2400x5502, or mail them to Don Cadien, Marine Biology Lab - JWPCP, 24501 S. Figueroa St., Carson, CA., 90745.

ED. 4

Where is it? What in Hades is taking so long?!!! When will I have a copy to work with? All very good questions. Edition 4 of the SCAMIT listing of benthic invertebrates is still homing in on completion. It has been delayed by a number of factors, not the least of which was the desire to incorporate all changes resulting from the Taxonomic Atlas series published by the Santa Barbara Museum of

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SCAMIT Newsletter is not deemed to be valid publication for formal taxonomic purposes.

Natural History. The discussions resulting from the last polychaete, and last series volume (Volume 7), are being held on 11 June as the topic of that month's SCAMIT meeting. This is the last input hurdle to be crossed. Once the conclusions (reached at the June meeting) regarding SCAMIT usage are available, Ed. 4 can be finalized. A number of members have contributed information concerning changes to Ed. 3, and all deserve our thanks. Any other comments are still welcome and actively solicited. Dale Calder, for instance, recently visited the Santa Barbara Museum and while there provided updates to the nomenclature used in the Atlas Cnidaria volume. These were forwarded by Eric Hochberg, and will be incorporated into Ed. 4. Production will take some weeks, but availability of the new edition is expected in August. Thanks for the patience you have already exhibited, and (in advance) for its continuation. Please avail yourself, within the next few weeks, of the opportunity to finalize and submit all changes which should be included in this new edition .

NEW LITERATURE

Earlier newsletters have introduced several papers dealing with the utility of nematocysts in cnidarian classification. Östman (2000) revisits this territory and provides an update to the nomenclature of nematocysts. A collection of images gleaned from both light microscopes and scanning electron microscopes are used to illustrate the types of nematocysts and the terms which describe them. Although few SCAMIT members routinely investigate the cnidom of cnidarians they seek to identify, it remains a useful (sometimes necessary) addition to other morphological characters.

In a paper dealing with several mysid species Fukuoka and Murano (2001) place *Acanthomysis brunnea* in the synonymy of *Columbiaemysis ignota*. Since *A. brunnea* was fairly recently described by Murano & Chess we can be sure this synonymy was not suggested lightly.

Living in Southern California we can anticipate, if not predict, the onset of another ENSO event in the near future. Having witnessed the influx of southern forms associated with the last strong ENSO event, we can also anticipate and prepare for a similar effect next time. The most obvious method of doing so is to become more familiar with the southern fauna. The isopod fauna of the adjacent tropical eastern Pacific region is summarized by Espinosa-Pérez & Hendrickx (2001). They document the southern range limits of species whose distribution is predominantly temperate, as well as providing a comprehensive listing of the taxa found in (usually) southern warm waters. Although some historic records are viewed as incorrect (and corrections provided for these erroneous accounts) 124 isopod species were viewed as occurring within the coverage area. The comprehensive bibliography also alerts us to numerous sources in the Mexican literature of which we may not have been familiar.

Aspects of the ecology of several local decapod species are examined by Dugan et al (2000). Three burrowing hippid crabs are compared with respect to their ability to burrow, and their behavior in response to intertidal water motion. The authors found that while burrowing speed in the sand crab *Emerita analoga* was not significantly affected by sediment type, that of the mole crab *Lepidopa californica* and the spiny mole crab *Blepharipoda occidentalis* was (it was reduced in coarse sediments). Their consequent habitat restriction to fine sands seems to support the "swash exclusion hypothesis" and limits the latter two species almost entirely to subtidal occurrence.

The relative value of "hard" (read shell and radula) vs. "soft" (read anatomy of tissues and organs) characters in both mollusk phenetic and phylogenetic analyses has long been a source of debate. As with any group possessing hard parts and, in consequence, a lengthy fossil record, there are always proponents of the idea that only hard structures

can be used if data from extinct taxa is to be included. Such direct evidence of the path of evolution within the group is highly valued. Others contend that local forces act primarily on the shell, and that shell features of taxa from different lineages tend to converge within habitat. This faction would minimize or eliminate hard part evidence, despite the sacrifice of most of the fossil record, to avoid homoplasy noise introduced by convergent shell structure. A number of authors have straddled this ideological fence and used data from all available sources. Schander and Sundberg (2001) weigh in with a new analysis examining a series of such studies using both hard and soft characters. Within each study the consistency and retention indices were calculated and compared for the two types of characters. They found no statistical evidence that homoplasy was greater in the shell than in the tissue characters used. They did point out that obviously homoplastic shell characters may have been rejected by the authors before analysis was undertaken. If we assume the 28 studies examined are fairly typical, there does not appear to be a sufficient rationale, on the basis of homoplasy, to ignore shell characters in the phyletic analysis of mollusks.

Rouse (2000) revisits evidence from larval feeding and its effect on phyletic analyses of metazoan relationships. His reconsideration points not to plesiomorphy of down-stream larval feeding, but rather repeated origination and loss. He concludes that it is more defensible to hypothesize lecithotrophy as the plesiomorphic larval nutritive mode in the Spiralia. Read the paper and see if you concur.

Research on the small and widely distributed ophiuroid *Amphipholis squamata* has been intensive in recent years. Deheyn has published many reports discussing bioluminescence and variations in color and color pattern within and between distant populations of the species (see meeting minutes concerning his presentation). Dupont et al (2000) test the link between genetic and morphological and physiological variations observed over the species' range. They found homogenous gene structure within each variant color pattern within each population, and variations between the same variant in distant populations. Resolution of this taxon into a complex of closely related species remains a possibility under investigation.

Multivariate analyses typically exclude that portion of the fauna which occurs only infrequently and/or at very low density. While the basis of this is generally that such small signals cannot be distinguished statistically from background noise, the unfortunate result is exclusion of virtually all rare species from analysis. This is repugnant not only on the philosophical basis of viewing the most inclusive analysis as best representing the community, but also because rare species have unique characteristics. While rarity is not a simple issue, it is often assumed that most rare species either require specialized habitats of limited availability (are stenotopic) or are less able to survive in suboptimal environments, such as those impacted by man (are sensitive). Their elimination skews perceptions of the community by only considering eurytopic species tolerant of perturbed and suboptimal habitats. This renders determinations of similarity between sites adjacent to and distant from anthropogenic inputs suspect, or at least less persuasive. There is evidence that when rarity results not from any character of the taxon concerned, but from competitive exclusion by other species, most rare species populations increase in response to disturbance of the competitive balance (Hawkins et al 2000).

Cao et al (2001) review the rare species situation in multivariate analyses conducted with newer analytic tools and procedures. They suggest that the theoretical justification for ignoring rare species is weak, and that adjustments to sample size and analytical procedure can facilitate their inclusion in

analysis. Although viewed from a freshwater perspective, the authors' comments should be considered by those using multivariate methods on marine benthic community data.

MINUTES OF APRIL 9 MEETING

The meeting was held at the Scripps Insititution of Oceanography. President Ron Velarde opened the business portion of the meeting. The Coastal Zone 2001 conference will be held in Cleveland, Ohio on July 15 through 19, 2001.

In San Diego, the newly formed position of Assistant Deputy Director of the Metropolitan Wastewater Department was filled by Lori Vereker.

Jobs available with the Coastal Commission are currently being advertised. Information on these positions is available on the Commission's web site,

www.coastal.ca.gov.

The guest speaker for the day was Larry Lovell. His presentation was on the polychaete family Lumbrineridae from the Bight'98 project. Larry was responsible for identifying all of the Lumbrinerids for that project. He provided the attendees with handouts of species lists and keys so we could follow along during his talk. The presentation began with an overview of the Bight'98 project.

Bight'98 sampled 343 benthic sites. 157,785 total individuals were collected and identified as 1429 taxa, of which 1071 were at species level. Lumbrineridae was the 4th most numerous polychaete family in the samples. There were 28,036 members of the family Spionidae; 9,635 Sabellidae; 9,242 Capitellidae; and 6,502 Lumbrineridae. The large numbers of individuals in these 4 families resulted from the numerous sample sites in bays and estuaries, prime habitats for these groups. Larry was asked to identify all the lumbrinerids in order to increase the accuracy and consistency of the data. Our previous experience with the 1994 Bight Pilot Project lumbrinerid identifications showed that in many cases we had to regress from species level to generic level due to identification inconsistencies between labs.

Larry presented a chart showing the species names, sum of abundances, and number of occurrences for each of the species. No specimens of *Lumbrineris index* were recorded for the Bight'98 project. He commented on a few changes, noting that *Lumbrineris erecta* should be moved to *Eranno*. In his identifications, Larry distinguished between *Scoletoma* sp A of Harris, *S.* sp B of Harris, *S.* sp C of Harris, and *Scoletoma tetraura* Cmplx. This resulted in a lower number of unidentified specimens being at the family level. Larry also corrected an error in the SCAMIT Species List, Ed. 3: on page 68, number 3358, change the author date for *Eranno bicirrata* (Treadwell 1922) to (Treadwell 1929).

"How much of an animal do you need to identify it to species?" Larry was asked. He replied about 20 segments were needed to identify animals to species level. Larry explained how field sampling methods and subsequent sample handling are very important factors in limiting fragmentation of lumbrinerids as well as other polychaetes. Field sampling methods are critical because they are the first step in sample handling . The samples should be screened gently and a relaxant should be used before the samples are fixed. The sorting process should be performed as gently as possible. At most labs, biomassing of the sample is the next and final step before the taxonomists receive the samples. Care must be taken during this process also. These are the main areas where fragmentation can happen. We concurred that the most damage probably happens during field sampling procedures. Varying sediments also play a part in fragmentation and can increase the difficulty of screening and sorting animals. This led to a discussion about the screening

procedures that are used by different labs, noting that some labs use float tables to sluice sediment onto a screen and others use a hose to wash sediment directly to a screen .

The question was asked, "at what size are lumbrinerids considered juvenile?" Larry defines a juvenile lumbrinerid as an individual 1mm in width and 10mm in length or smaller. But that may not be true for all species. Juvenile tends to be used as a catch-all term by Larry for specimens too small to speciate.

Larry's keys to the genera and keys to the species were handed out. The definitions of black and yellow acicula were reviewed and we noted that there may be more than one acicula per parapodium in some specimens. *Lumbrineris* was the first genus to be discussed. We were referred to the images of *L. latreilli* and *L. limicola* in the MMS Atlas for comparisons of parapodial lobes in the anterior and posterior regions. At the bottom of the handout there were images of an unusual worm which Larry referred to as *Lumbrineris* nr *limicola*. These were smaller worms which Larry at first had called *L. latreilli* because the posterior postsetal lobes were short and rounded. His later re-examination revealed that while the post-setal lobes in the posterior region were short as in *L. latreilli*, the anterior segments had both pre- and post-setal lobes with the post-setal lobe being longer.

We reviewed the *Errano* key and Larry noted that specimens of *Eranno* tend to have a swollen buccal area. He reminded us of the inclusion of the new combination, *Eranno erecta*. The comment was made that *E. erecta* can also be orange-brown colored in the anterior, like *Scoletoma* sp C of Harris.

The *Scoletoma* key was next. There was a question about *Scoletoma minima* (Hartman 1944), as there was some confusion about its similarity to *S.* sp C Harris. This was probably due to a statement in Hartman (1944) that the simple hooks begin on setiger 13 on the type but that another specimen had hooks beginning on setiger 1. In the Atlas (1968) she only mentioned setiger 13. Leslie has examined all of the original material cited in Hartman 1944. The hooks actually start on setiger 10 on the type, and on setiger 9 on one other animal. The type lacks its posteriormost segments, however the postsetal lobes are longer than the presetal lobes at the end of the specimen. This is contrary to the statements in Hartman (1944 & 1968) that the presetal lobes are longer. The longer lobe in figure 308 in Hartman 1944 (and figure 4 in Hartman 1968) is actually the postsetal lobe.

We then welcomed Dr. Dimitri D. Deheyn from UCSD-Scripps Institution of Oceanography. He gave a presentation on "Shedding light on the subject of pollution: could bioluminescence of brittlestars be used in ecotoxicological research?".

He started the talk by defining some of the terminology he would be using including pollution, ecotoxicology, biosensors, bioassays, sentinel organisms, biocenosis, biodiversity, bioconcentration, and bioavailability. There are different tools used to access and measure toxicity. An example of a test that is used is the Microtox® test. This test uses bioluminescent bacteria as the test organism and measures the decrease in bioluminescence with increased toxicity. The results of this test from single cell organisms tell us about toxicity and bioavailability but not accumulation and resulting bioconcentration.

The question was asked, can you take bacterial toxicity values and extrapolate them to metazoans? Metazoans can tell you about bioavailability and bioconcentration but not toxicity.

Dimitri gave examples of bioluminescence in several different phylogenetic groups. Bioluminescence is the production of visible light by living organisms. It is a physiological character sensitive to environment quality and is under nervous control in metazoans. Dimitri believes that it could be used as indicator of

toxicity, as used from the luminous bacteria. In the echinodermata there are examples of bioluminescent species in the Ophiuroidea, Crinoidea, Holothuroidea, and Asteroidea.

There are about 2000 species of ophiuroids and 35 have been found to bioluminesce, however, not all species have been tested. Ophiuroids make good test organisms as many live in the sediment, which is the end reservoir of pollutants and they are easy to maintain in an aquarium.

Dimitri discussed the possibility of using the bioluminescent ophiuroid *Ophiopsila californica* as a sentinel organism as they are abundant and easy to collect. In addition, they are widespread and found in the deep sea which is starting to be explored more frequently. The questions he was interested in were: 1) can they bioaccumulate pollutants?, 2) what is their tolerance to pollutants?, and 3) is their bioluminescence affected by contamination with heavy metals?

In one experiment, Dimitri exposed *Ophiothrix spiculata* and sediment to different concentrations of cadmium. The results showed a correlation between accumulation and contamination which was expected. The accumulation was about 10 times greater in brittlestars than in the sediment. He concluded that metals accumulated in brittlestars reflect bioavailable metal in the environment and indicate biomagnification of metal concentration.

Dimitri described the kinetics of metal bioaccumuation in an experiment where the animals were exposed to metal contamination for 40 days. He found that accumulation started after one day of exposure and was dose-dependent. After the contamination phase the animals were put back into normal sea water and decontamination followed for 30 days. It appeared that cadmium was slowly elimated by brittlestars into the water, not back into the sediments.

The next experiment Dimitri performed was in Portman, Spain. The area was a mining site that was highly contaminated with a gradient of heavy metals (Cd, Cu, Fe, Pb, Zn).

He collected *Amphipholis squamata* (a luminous brittlestar) from 3 different stations. The sediment contamination increased from station 0 to station 1 to station 2. He measured the bioluminescence and found that it was less intense and slower at the more contaminated sites.

In another experiment, Dimitri transplanted individuals from the least contaminated site (station 0) to the most contaminated site (station 2). After 3 days there was a decrease in bioluminescence intensity and an increase of bioluminescence kinetics (slower to flash). Although there were no statistically significant results, it was concluded that brittlestar bioluminescence seems to be sensitive to heavy metal contamination.

Dimitri has also investigated the effects of various metals on the bioluminescence of photocytes isolated from *Ophiopsila californica*. It was discovered that Ag, Cd, Cu, Hg had negative effects on light production, while Al, Cr, Fe, Mn, Pb, U, and Zn had no significant effect.

Aside from being interesting from a toxicological perspective, bioluminescence can also serve in escaping predators. Dimitri showed a movie of a crab attacking a specimen of *Ophiopsila califonica*. As the attack began the ophiuroid writhed and luminesced. The crab pulled an arm off the ophiuroid and while it manipulated the detached, bioluminescent arm, the rest of the ophiuroid escaped.

The conclusions of Dimitri's presentation were:1) brittlestars accumulate efficiently and can tolerate high concentrations in their tissues, 2) bioluminescence in luminous brittlestars is affected in a dose-dependent manner by certain

heavy metals, and 3) bioluminescence of luminous brittlestars could be used as luminous bacteria bioassays to assess physiological and overall toxicity of a pollutant in metazoans.

After eating lunch at the SIO snack bar and enjoying a spectacular view, we had another guest speaker. Sergio Salazar-Vallejo presented "Polychaetes from the Mexican Caribbean and beyond...?" This was a brief chronology of the main actions in the Program on Caribbean Polychaetes that Sergio lead in Ecosur-Chetumal. His handout is included as an attachment to this newsletter. Vice-President Leslie Harris commented that she hopes all of Sergio's students will give presentations of their work at future SCAMIT meetings.

We returned to lumbrinerids and viewed some specimens that Larry brought. Larry put the specimens under the microscope and Kelvin Barwick of the City of San Diego Lab digitized the images and projected them on a screen by interfacing with a slide projector. Kelvin also saved the images in a file for Larry's later use in producing voucher sheets.

The first specimens we examined were of the *Scoletoma tetraura* complex. According to Leslie Harris, there are at least three different local forms which will key out to this species. None of these can be attributed to *S. tetraura sensu stricto* until an accurate redescription of type or topotype material is published. Large, robust (up to 7 mm width) specimens with broadly conical prostomiums are found in shallow waters (embayments and intertidal to shallow subtidal); these are close to *S. tetraura sensu lato* (as in Hartman 1969). Specimens from deeper soft-bottom habitats are long, thin animals (up to 2.5 mm wide) with narrower, pointed prostomiums, and fall into two groups: the ones with posterior postsetal lobes 1-2 times longer than the parapodial lobes when fully extended also belong to *S. tetraura sensu lato*, while those with posterior postsetal lobes 2-4 times longer than the parapodial lobes when fully extended belong to *S. luti* (Berkeley & Berkeley 1945) (this name combination has not yet been published). Differences in jaw structure exist as well. Dot Norris commented that the specimens of what they call *Lumbrineris luti* from San Francisco look very similar to the southern California deep water specimen of *S. tetraura* complex . It was noted that *S. luti* has simple setae from the first setiger like *S.* sp C of Harris, but only the postsetal lobes are prolonged in the posterior whereas both pre- and post-setal lobes are prolonged in *S.* sp. C of Harris. We reviewed the *Scoletoma tetraura* description in the MMS Atlas and noted that no southern California material was examined by Hilbig. Hilbig's figures of setae and parapodia were copied from illustrations of specimens from Argentina and Uruguay (Orensanz 1973), and the setae in Figure 11.13. (page 310) did not resemble the setae on the Bight'98 specimen that we examined. Without examining Hilbig's MMS specimens we cannot know if they match any of our local species.

Next up on the microscope were *Scoletoma* sp A and *Scoletoma* sp B. They were both long, thin animals. Larry noted that it is sometimes difficult to get enough setigers for an identification. We first viewed a specimen of *S.* sp A from Bight'98 and examined setigers 9 and 10. The simple hooks can start from setiger 4-9; the average is 6-8. We then viewed the posterior of the specimen; it had prolonged postsetal lobes. Upon examining a median parapodium, we saw that the postsetal lobe was not as long, measuring about 1/2 the length of the posterior lobes and there was no presetal lobe. We then viewed a close-up of a hooded hook (from a median setiger) to compare to the hooded hook of *S. tetraura*.

We then examined *Scoletoma* sp B. A small palpode on the tip of the prostomium was discovered. Hooks were from setigers 4-9 with the average 6-8. We examined a simple hooded hook on setiger 7. A seta from the median posterior section of the worm had a

main fang with multiple teeth above. We viewed a parapodia from a median segment and noted that the postsetal lobe was somewhat prolonged, and the presetal lobe was just beginning to protrude. Further back the specimen had slightly more prolonged pre and postsetal lobes. A far posterior parapod had well developed prolonged pre and postsetal lobes.

We went back and viewed the prostomium of *Scoletoma* sp A; like *Scoletoma* sp B it also had a nipple-shaped palpode on the tip of the prostomium. We viewed a median posterior seta and noted the insertion points of the hood.

A specimen of *Scoletoma* sp C was examined next. The anterior and median areas of the worm were orangish in color. We viewed the posterior end, and there were prolonged pre and postsetal lobes. Hooded hooks started on setiger 1. *S.* sp C is usually collected in harbors and bays (SD Bay and Mission Bay). Next, we viewed a median parapodia; the lobes were just beginning to develop and the hooded hook had a main fang and multiple teeth. There was no obvious palpode on the prostomium of this animal.

We then examined a specimen of *Lumbrineris latreilli*. In the median segments, the postsetal lobes were only slightly developed. In the posterior segments, the postsetal lobes were rounded with blunt tips.

The next specimen we viewed was *Lumbrineris limicola*. In the medial segments, the postsetal lobes were somewhat tapered. In the medial posterior segments, the postsetal lobes were long, tapered, and digitate.

We then viewed a specimen of *Lumbrineris* nr *limicola* that was approximaely 15 mm in length and 1/2 mm wide. In the posterior end, the postsetal lobes were slightly prolonged and rounded. In the median segments, the postsetal lobe was longer and had a digitate presetal lobe. This specimen had yellow acicula. The presetal lobes were apparent in the middle section of the animal, but they disappeared by the posterior end. This pattern was opposite of most lumbrinerids. We concluded that Larry should make this a provisional species.

We examined the methyl green stain pattern of *Lumbrinerides platypygos*. There were unstaining "stripes" on the prostomium with two being dorsal and two being ventral.

The last animal we viewed was *Eranno erecta*. The simple hooks started on the first setiger. The maxillary apparatus fit the description for *Eranno*.

[The meeting handouts which Larry distributed, as modified by the discussions which took place at the meeting, are appended to this Newsletter.]

NEW JOURNAL

The following announcement was recently made on the internet. The subject is of considerable interest to SCAMIT members and other taxonomists.

A new journal named "ZOOTAXA" is being launched for rapid publication of taxonomic papers. Zootaxa is a forum for zootaxonomists to help each other in publishing their work. It is a fast and free outlet for publications on any aspect of animal taxonomy, including taxonomic monographs, systematic catalogues, checklists, bibliographies, identification guides, analysis of phylogenetic relationships and zoogeographical patterns of distribution, descriptions of taxa, etc. Unlike other journals, there is no restriction on the length of manuscripts. There is also no page charge. Zootaxa aims to publish each paper within one month after the acceptance. More info at:

www.mapress.com/zootaxa/

You are welcome to submit your mss to Zootaxa. For the first few papers, we will make them free online for everyone and publication can happen within a few weeks if it is suitable after review.

Thank you for your attention.
Z.-Q. Zhang
Editor, Zootaxa
www.mapress.com/zootaxa/

B'98 UPDATE

The analytic phase in handling of data generated during the Bight '98 program has begun. There are still a few residual data problems, but even so, analyses have started. Both Trawl and Benthic committees have been meeting for several months to address the data. In the benthic program the data collected by colleagues in Mexico has been completely analyzed, and is now being included with other sampled areas throughout the Bight in multivariate analyses. This represents a welcome first in handling of the regional biology, and should yield better understanding of the contiguous geographic communities as a whole. Initial classification analyses seem to cluster samples from similar habitats in the expected manner, with few surprises. Since the spectrum of environments investigated in B'98 was significantly broader than that in SCBPP, the analyses are particularly informative at showing the faunal relationships between these habitats.

Trawl data has also been examined via classification analysis, and the initial runs seem to provide station clusters based on habitat within depth. Depth was still the variable which seemed to provide the overarching structure of the dataset. Within depth, habitat variables seemed to account for most of the variability and sediment variables, a smaller proportion. About 30 different subpopulations are being investigated within the dataset. The trawl data is also being analyzed cladistically. Cladistic analysis of the environmental data was briefly considered during the SCBPP, but too late in the process to be pursued at that time. We are attempting it again (with thanks and considerable indebtedness to Greg Deets of CLAEMD for running the analyses) in parallel to the classification analysis. So far the results are generally similar, differing only in particulars. Since most members of the committee have either limited or no experience in this application of cladistics, Greg has made several tutorial presentations to help us interpret the results.

CARLTON COMMENTS

Dr. Jim Carlton is a newsletter reader who provides feedback on what he reads, much to the delight of the editor and the edification of other readers. His recent comments on the December NL are reproduced below.

"The December '00 SCAMIT newsletter (19(8)) was on my desk upon my return from a March trip to Washington, Oregon, and California. Two quick items:

(1): Re: unidentified Pt. Loma mottled green amphipods under the limpet *Lottia*:
There's a nice paper by Johnson (1968):
Samuel E. Johnson II. 1968. Occurrence and behavior of *Hyale grandicornis*, a gammarid amphipod commensal in the genus *Acmaea*. Veliger, volume 11, Supplement (The Biology of *Acmaea*), pp. 56-60.
"[at Pacific Grove] mottled grey-green amphipods were frequently encountered under the shell of [the limpets] *digitalis*, *limatula*, *pelta*, *scabra*, *scutum*, and *gigantea*.... Dr. J. Laurens Barnard... has identified the amphipods as immature specimens of *Hyale grandicornis* (Krøyer, 1845)". (There's a figure, and the paper goes on at length about the amphipod) [that name may have changed in the past 30+ years, of course [it hasn't - ed.]]

(2) Re: the cosmo sandy beach worm *Hesionides arenaria arenaria*: "This tiny worm proves to be a valid taxon with a very broad distribution. How this was established and maintained remains to be demonstrated, although anthropogenic influence in distribution of a sandy beach interstitial polychaete seems unlikely".

I have not seen the paper by Schmidt & Westheide (1999), so I don't know what they say about global dispersal mechanisms, but it's important to note that marine beach sand was used as ships' ballast for hundreds of years. It may have been a very effective transport vector."

Thanks to Jim for his continued feedback, and for the suggestions he forwarded. I, for one, had not considered beach sand as a ballasting agent. His comment on its earlier use is thought provoking.

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Polychaetes from the Mexican Caribbean and beyond...?

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9 April 2001
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This is a brief chronology to indicate the main actions in our Program on Caribbean Polychaetes that I lead in Ecosur-Chetumal. It will show how we have been increasing our regional focus from the Mexican Caribbean coasts, to the Grand Caribbean Sea, and then to the world, since this is perhaps the best way to address taxonomical problems.

1986. John Markham had a sabbatical year in CIQRO which was by then in Puerto Morelos, a small town some 30 km south from Cancun. He and Eduardo Donath started the Reference Collection and their sampling concentrated mainly on bopyrid isopods and cumaceans but they brought many invertebrates.

1988. Hurricane Gilbert crossed the Yucatan Peninsula and its eye moved over Puerto Morelos. The library, labs and research houses were completely destroyed and CIQRO was partly moved to Cancun.

1989. After a strike was finished upon the promises of the State Governor, the local authorities came and took up everything they found and brought everything to Chetumal. This was the second hurricane affecting the collections. Once in Chetumal, because most researchers had been fired, I was hired and asked to do Taxonomy but because of the heavy pressure on coastal environments, I decided to insist on coastal zone management because I thought the decision makers were needing some ecological advice. After several years talking to the walls, and realizing that what decision makers need is a different approach, my wife and I decided to finish this kind of activity.

1993. My wife and I co-edited a synthesis on marine and coastal biodiversity of Mexico; then I could return to taxonomy.

1994. In their second call for research projects by Conabio, we got funding to prepare a monograph on the Mexican Caribbean polychaetes. Our original timing was 3 years and the objectives included making a sort of Hartman's California Polychaetes set and increasing our Reference Collection. Conabio asked to cut the budget and timing by half and asked us to prepare a Data Bank on every single specimen in our collection. I did not pay attention to the fact that only the data bank would be enough but failed to remove our original objectives, so it is easy to anticipate some troubles.

1995. CIQRO was closed by a State Goverment decree; the key issue was to steal the coastal lands that it had and have the chance to sell them. Ecosur took charge of the building and hired most of the researchers. In the meantime, the Conabio 1.5 year period had finished and we had provided a couple of data banks but they were not 100% complete, they were 95% complete and, of course, the monograph was not finished. Our arguments were that we had noted that there were many taxonomical problems and that using Scandivanian names would be worse, so we did not want to increase the problems. During this time, I prepared the checklist and bibliography on polychaetes from the Grand Caribbean Sea. Conabio rejected our arguments and I got a red dot over my file and since then we have been unable to have any further funding. During that time, however, Soledad Jiménez and I could prepare the notes on Phyllodocidae, Nereididae, Amphinomidae (+ Euphrosinidae), Maldanidae, and Luis F. Carrera arrived and we prepared three notes on Eunicidae.

1997. Conacyt gave us funding for a research project on coastal benthos from southern Quintana Roo. Our objectives were to study the landscape variations and the benthic community structure in two spots that would have a different level of tourism development.

1998. Rolando Bastida came to Ecosur graduate program for his Master degree and he started studying the serpulids from the Grand Caribbean Sea.

1999. Luis enters the Master program and starts studying the lumberinerids. Rolando finishes his Master studies and his proposal for his doctoral degree is to review *Hydroides* from all over the world. I spent two months in Paris to sort out the Musorstom Expeditions polychaete materials and prepare a listing of its lots. Jennifer Ruiz finishes her Biologist thesis on Exogoninae.

2000. Conacyt provides us with additional funding for a project only on taxonomy of polychaetes; this would allow us to send the students to several museums and to bring some experts to work with some of us. Rolando and Patricia Salazar (who is working on Polynoidae), enter the doctoral program in Ecosur. Luis finishes his master degree and his proposal for his doctoral degree is to review *Lumbrineris* from all over the world. Patricia, Rolando, Luis and I spent one month in Miami to sort out the polychaete materials from the University of Miami Deep Sea Expeditions and prepared a list of its lots. Jennifer enters the Master program; she starts studying the Syllinae and Eusyllinae from the Grand Caribbean Sea.

2001. Victor Delgado, who is working on Spionidae, and Luis enter the doctoral program in Ecosur. Mario Londoño, a Colombian student who is working on Terebellidae, enters the Master program. We had the Taxonomy and Evolution of Polychaetes workshops with several experts on different groups: Lobo Orensanz, Kirk Fitzhugh, Fredrik Pleijel, Leslie Harris, Kristian Fauchald and Harry ten Hove.

Without my devaluation in Mexico, Conacyt funding will allow some visits in the near future. Hope we can have then this same success.

Current research topics in Chetumal

Jennifer Ruiz is studying the Syllinae and Eusylinae from the Grand Caribbean Sea. She has a manuscript with Leslie Harris on a new species. She is expected to spend one month in Madrid to work with Guillermo San Martín.

Patricia Salazar is studying the Polynoidae from the Grand Caribbean Sea. She has found an undescribed species confused with *Hermenia verruculosa* and a new genus and species from a bathypelagic harmothoin. She will spend two months in Washington to understand the phylogeny of these worms and will work with Kristian Fauchald.

Luis E. Gonález is just going to have his Biologist degree. He analysed the taxonomy and ecology of *Neries oligohalina* and we are describing a new species, and *Laeoneries culveri* over which he is preparing a paper with Paulo de Paiva.

Luis F. Carrera will review the *Lumbrineris* of the world; he has already restated *Cenogenus* Chamberlin which includes *Paraninoe* Levenstein, reviewed *Ninoe* with Lobo Orensanz, and made a revisionary note on *Hartmaniella tulearensis*. He must spend some time in either Paris or London later on this year or early in 2002.

Mario Londoño worked on mangrove root polychaetes and is now studying the Terebellidae. During 2001 he will have to pass the courses so he will return to the microscope in 2002.

Rolando Bastida is expected to spend one month in Sydney to finish his revision. He is almost finished with a couple of papers on *Hydroides*, one will cover species from the Western Atlantic and the other will include species from the Eastern Pacific. Both papers will be with Harry ten Hove.

Victor Delgado has finished a paper on a new species of *Minuspio* (Spionidae) with Leslie Harris; he is expected to spend some time working in Los Angeles Museum and in Pontal de Sul, to work with Vasily Radashevsky.

Sergio I. Salazar-Vallejo has a nearly complete revision of "*Synelmis albini*" of the world and is working on a paper on Eastern Pacific *Pilargis* with Leslie Harris. Other forthcoming papers will be on *Pseudoexogone* (including "*Synelmis dineti*") with Minoru Imajima, then, it would follow *Ancistrosyllis*, *Glyphohesione* and Nautillinielidae...

Because there is a limit of 4 graduate students for each researcher in Ecosur, and I already have six, it seems difficult that I would be allowed to have more students in the near future.

Thus, Luis González and María Ana Tovar, both very hard-working and bright students, would require another program to get their degrees. However, they could come back to Chetumal for their research. Luis would keep on working on nereidids and Maria Ana would be interested in working on sabellids with Kirk Fitzhugh.

Bight '98 Lumbrineridae

By Lawrence L. Lovell

Eranno bicirrata (Treadwell, 1929) (not 1922 as in Ed 3 list)
Eranno erecta (Moore, 1904) (new combination)
Eranno lagunae (Fauchald, 1970)

Lumbrinerides platypygos (Fauchald, 1970)

Lumbrineris californiensis Hartman, 1944
Lumbrineris cruzensis Hartman, 1944
Lumbrineris index Moore, 1911 *
Lumbrineris japonica (Marenzeller, 1879)
Lumbrineris latreilli (Audouin & Milne-Edwards, 1834)
Lumbrineris limicola Hartman, 1944
Lumbrineris sp. D of Lovell +

Ninoe tridentata Hilbig, 1995

Scoletoma luti (Berkeley and Berkeley, 1945) +
Scoletoma tetraura (Schmarda, 1861) +
Scoletoma sp. A of Harris
Scoletoma sp. B of Harris
Scoletoma sp. C of Harris

* This species was not reported in Bight '98 samples.
\+ These species were reported under other names in the Bight '98 project.

Key to the Bight '98 Lumbrineridae Genera

By Lawrence L. Lovell

1. Simple and composite hooks present . . . . . *Lumbrineris*

1. Simple hooks only 2

2. Simple hooks bidentate, prostomium prolonged . . *Lumbrinerides*

2. Simple hooks multidentate 3

3. Anterior parapodia with branchiae . . . . . *Ninoe*

3. Branchiae absent 4

4. M II 1/2 as long as M I, with sclerotized ligament . . . . . *Eranno*

4. M II subequal to M I, with thin ligament . . . . . *Scoletoma*

Key to the Species of *Eranno* Kinberg, 1865, emended Orensanz, 1990

By Lawrence L. Lovell

1. Acicula black . . . . . *Eranno bicirrata* (Treadwell, 1929)

1. Acicula yellow 2

2. Pre and postsetal lobes prolonged . . . . .

Key to the Species of *Lumbrineris* Blainville, 1828

By Lawrence L. Lovell

1. Acicula black 2
1. Acicula yellow 4

2. Pre and postsetal lobes present, anterior segments with poorly developed lobes . . . . .

Key to the Bight '98 *Scoletoma* Blainville, 1828, emended Frame, 1992

by Lawrence L. Lovell

1. Simple hooks begin from setiger 1 2

1. Simple hooks begin from setiger 4-9, usually 6-8 . . 4

2. Pre and postsetal lobes developed, body sometimes orangish colored . . . . . *Scoletoma* sp. C of Harris

2. Only postsetal lobe developed, especially in far posterior segments 3

3. Postsetal lobes directed obliquely upward in posterior segments, body robust, prostomium conical . . . . *Scoletoma tetraura* (Schmarda, 1861)

3. Postsetal lobes directed laterally, not upward; in posterior segments; body thin, elongate, prostomium triangular; maxillary apparatus seen through dorsum looking like eyespots . . . . *Scoletoma luti* (Berkeley and Berkeley, 1945)

3. Posterior segments with prolonged pre and postsetal lobes . . . . . *Scoletoma* sp. B of Harris

4. Posterior segments with postsetal lobes only . . . . . *Scoletoma* sp. A of Harris

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